THE

VETERINARY JOURNAL

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Obituary

The late Mr. REGINALD BRISTOW, B.Sc.(Edin.), M.R.C.V.S.*

REGINALD BRISTOW died on January 21st following an operation for a dislocated spine which resulted from an accident. He was run down from behind by a motor car on January 17th, when walking in the country near Glasgow.

The second son of Charles Bristow, Esq., The Manor House, Wolferton, King's Lynn, Norfolk, he was born in 1890 and educated at Sedbergh School. He played for the first Rugby XV, for which he was given his cap.

In 1907 he started farming in Canada, and as soon as war broke out in 1914, placed his farm under management so that he could join the army. As an enthusiastic horseman, he wished to join a mounted unit, but on finding that at that time there was not much chance of going overseas in that branch of the Service, he joined a Canadian infantry battalion. Subsequently, he obtained a commission in the Royal Field Artillery, with whom he saw service in the Balkans and in Palestine.

He was wounded on two occasions. The first wound was in the shoulder while on the Balkan Front. In Palestine he was shot through the chest when as a forward observation officer, he had taken up a very exposed position in advance of the trenches in order to obtain the information he required.

On demobilisation he joined the Royal (Dick) Veterinary College, Edinburgh, where he had a very distinguished career. He graduated as a Member of the Royal College of Veterinary Surgeons in December, 1922, and in March, 1923, obtained the degree of B.Sc. (Veterinary Science) of Edinburgh University.

* We are indebted to Capt. W. A. Pool, M.R.C.V.S., an intimate friend of the late Mr. Bristow, for this appreciation of our late colleague. (EDITOR *Vet. Journal.*)

He was captain of the Royal (Dick) Veterinary College Rugby XV for two years, and during that time the team only suffered defeat on two occasions, finishing second in the league in both years. He also captained the Edinburgh Inter-City junior team against Glasgow.

After spending a year in practice, he joined the staff of the Animal Diseases Research Association as second research assistant. Here he threw himself enthusiastically into the work and was rapidly building up a reputation as a pathologist.

A man of outstanding personality and a fine sportsman, his charming manner, sound practical knowledge of livestock, combined with his high scientific attainments, rendered him pre-eminently suitable for the work to which he had devoted his life. He was the type of man who is an ornament to any profession, and will be sadly missed by all with whom he came in contact.

Editorials

THE UNENVIABLE POSITION OF THE INDIAN VETERINARY SERVICE.

THE Indian Veterinary Service, better known to the profession under its old name of the Indian Civil Veterinary Department, is still, as it has been for years, fighting for " a place in the sun."

The members of this Service were originally recruited by the Secretary of State for India, from the young and newly qualified men ; preference being given to those with post-graduate qualifications. This latter was almost an essential, and the posts were filled after careful selection by the India Office. Latterly a similar selection was made from the ex-service candidates of the profession.

One would imagine that a service demanding nothing but the best in qualifications and bodily health (a stiff medical examination has to be passed) was likely to be a branch of the profession whose work was of primary importance to the country desirous of employing the men ; and one would naturally expect the emoluments and prospects to correspond with the high standard demanded.

On appointment to this service, a man must be prepared to live in a foreign country for 25 years before becoming available for a pension ; he must be qualified to teach any subject in the veterinary curriculum at a Government Veterinary College ; or do Research work in a Government Laboratory ; or take charge of a huge district and try to control the spread of infectious animal diseases with a hopelessly inadequate staff. A man selected and appointed as capable

of doing *any one* of these things would be a first-rate man! What of the man who is considered capable of fitting and effectually carrying out the duties of each and all of these. The Government of India, who employ these men, rate them at the lowest value of any of their Public Services, and this, too, in a country which is so dependent on Agriculture with its necessary agricultural animals.

Compared with the other Services, their pay and conditions of service and prospects are the worst of any—even after the last revision by the Lee Commission.

The Lee Commission pointed out the lack of a superior post in this service, but nothing has been done to rectify the omission, and representations from the Indian Veterinary Service Association are apparently treated with contempt. The Senior Veterinary Service man in each province is termed the Veterinary Adviser. He controls the work of the profession in the province, including the management of hospitals and dispensaries in towns and villages; and the control of infectious and contagious diseases of animals. In addition to these duties he advises the Government on all veterinary matters. He is the head of his department in the province, but £10 a month extra is considered to be a sufficient valuation of his responsibilities!

The Government of Burma (a province of India) found itself without the services of a senior I.V.S. man to fill the post of Veterinary Adviser. They called in a member of the profession employed in Rangoon to fill the post at the salary of £200 per month—double the amount the "specially selected," experienced Veterinary Service man could have obtained for performing the duties!

The Indian Veterinary Service Association complained to the Government of India over this appointment, as it should have been filled by a member of the I.V.S., but the injustice still remains unrectified. One would have thought that out of 35 men in the I.V.S. it would have been possible to find a man capable of carrying out the duties for which he was "specially selected."

However, the Government of Burma, by valuing the post of Veterinary Adviser at £200 per month have justified the claim of the I.V.S. before the Lee Commission, which was that this post should carry a higher scale of pay and pension, and be a recognised post in each large province; *but this has not been carried out, although the Lee Commission Minority Report recommended it. As things stand at present, a member of the I.V.S. has no chance of promotion outside the ordinary time-scale of pay.*

The I.V.S. has now become a "Transferred Subject" under the Reform Scheme; which means that each Provincial Government has its own Veterinary Service entirely under its own control, and,

as the post of Director-General has been abolished, these now separated services have no representative on the Government of India, an unenviable position in which no other service in India is placed. The Veterinary Service in each province is now entirely at the mercy of the local Provincial Governments, with no appeal to, or direction from, the Central Government. The members who joined since the war, all ex-service men, although allowed to count a proportion of their army service towards pay and pension, are not allowed to participate in the Proportionate Pension Scheme, with the result that, having been engaged under the old regime, with the idea of making a fresh start in life in a permanent post, they find conditions changed and are compelled to accept them willy-nilly, unless they are prepared to again make a fresh start by resigning and losing, not only their service with the Government of India, but also their hard-earned army service.

In the majority of cases these posts were only accepted because the bait of counting army service was offered; it is now realised that it was only a bait which has landed them in a trap from which there is only one way of escape, meaning a loss of from eight to ten years' pensionable service. These men, who compose 75 per cent. of the I.V.S., are now placed in the position of being under the control of a Local Provincial Government who is at liberty to employ veterinary help from any source on the "short-contract system," and it might easily happen they would be called upon to serve in a junior capacity to any man so employed in the position of Veterinary Adviser or Principal of a College, positions which would ordinarily have been filled by the senior men of the Service. *There is no appeal to higher authority, or means of obtaining a transfer from the service of the Government concerned, if they object to the imposition.* Many Indian students have been admitted to veterinary colleges in the British Isles, mostly at the expense of these local governments, and if the example of the Burma Government is to be taken as a sample of the treatment to be meted out to the permanent members of the I.V.S., the posts of Veterinary Adviser and Principal of a College will fall to these men on their return to India, when the present holders, who are all senior men, retire on proportionate or ordinary pension as the case may be.

As there is no restriction made on Provincial Governments regarding appointments to the services handed over to their control, it would not be obligatory for a man to be an M.R.C.V.S. to be appointed to a post in the present Provincial Veterinary Service. *There need be no selection by the Secretary of State for India with the help of senior members of the Indian Veterinary Service; these are not now concerned or consulted.*

India is an enormous country, chiefly agricultural, which has been governed by people who have not understood the value of veterinary science to the agriculturalist, with the result that veterinary help has been sparingly given and a fruitful field for investigation and research into animal diseases (economically very important to the country and its inhabitants) has been sadly neglected. The Veterinary Service in India is in its infancy, and its growth is being retarded by a parsimonious policy. Numerically, the present staff of the Veterinary Service is totally inadequate to cope successfully with the problems presented in any one branch of the work, either in Research, Teaching, or Executive; and no possible improvement can be hoped for by a continuation of the present policy of repression, parsimony and injustice to the present members of the Service.

Let the Government of India observe the methods of the successful agricultural colonies in South Africa, and compare their expenditure on veterinary science with that of India; there are doubtless differences and difficulties to be overcome in India which do not quite coincide with South African problems, but a beginning must be made some time if India is to take her place among civilised nations, and the sooner these problems are tackled the better.

The Indian Veterinary Service, decentralised and relegated to the background, with no co-ordinating authority as it is constituted at present, cannot produce the results necessary for the progress of Indian Agriculture. It originated as a half-hearted attempt at imitating the veterinary arrangements of civilised European countries, but has remained in its original conception through lack of encouragement, and neglect, of the persons responsible for the progress of agricultural welfare in India, helped by the short-sighted policy of earlier members of our own profession. The nucleus of an efficient veterinary establishment is all that exists, but it is not too late to build around this an edifice that would do credit to India and the Indian Empire. *The present unsatisfactory position and status of the officials of the Indian Veterinary Service requires ventilation in the British Veterinary Press and the cudgels should be taken up on their behalf by those who have the power to influence the future career of the unsuspecting student.*

At any rate, after this and other similar warnings, the young graduate will have no one to blame but himself if, after accepting a post in this Service he finds that the pay is inadequate and the position intolerable.

General Articles

THE VETERINARY HISTORY OF THE NORTH RUSSIAN EXPEDITIONARY FORCE ("ELOPE").

BY MAJOR FRANK CHAMBERS, O.B.E., F.R.C.V.S.,
late Deputy Assistant Director of Veterinary Services with the British Forces.

THE "ELOPE" portion of the N.R.E.F. departed from Newcastle on June 16th, 1918. All the Force embarked on one transport, the "City of Marseilles." The Royal Army Veterinary Corps personnel consisted of the D.A.D.V.S. (Major F. Chambers) and one clerk. The whole of the guns, ammunition, and three months' rations for the Force was in this one transport. All the officers and men were, with the exception of a complete stationary hospital, classified as instructors. The whole Force was commanded by Major-General F. Poole.

The Force arrived at Murmansk on June 23rd, 1918, and transferred to the "Stephen," a transport which had carried the "Syren" party. The object of this party was to seize and hold the Kola Peninsula, especially the Harbour of Pachenga, which the Germans had intended occupying as a submarine base.

During the voyage an outbreak of Spanish Influenza occurred on board, and practically everybody was attacked. Only one Britisher died, but 13 Lascar firemen succumbed and were buried at sea.

Murmansk is an excellent harbour, situated about 30 miles up the Kola River. It is surrounded by high ground, and is ice-free all the year round. A railway connects up the port with Petrograd. The quays are all wooden, strongly if roughly built. All this has been constructed since 1915. The town consists of a collection of very substantial wooden houses, which have double windows to exclude the cold during the winter and any chance of air getting in. The whole place is built on sand. There are no roads and there is no system of sanitation. Thousands of refugees, of all nationalities, were living in railway trucks. Their condition was pitiable.

At anchor in the river were two Russian battleships, the "Askold" and the "Chesma." The former was at the original bombardment of the Dardanelles Forts in 1915, but now contained a number of Bolshevik sailors who had, previous to our arrival, terrorised the town. After some days the "Askold" was boarded and disarmed, and all sailors of Bolshevik sympathies were put on rail and sent over our line at Soroka. This proved to be a foolish move, for during later operations on the Archangel Front, these sailors

proved to be the backbone of the Bolshevik Forces opposed to us. At the Revolution the sailors of the "Askold" murdered their captain by shooting him in the back. They elected a president—a steward—who shortly afterwards offended them, whereupon they promptly threw him alive under the boilers.

There were a number of excellent ponies working in Murmansk, and the stables were good. I saw one very acute case of Purpura there. The "Stephen" which brought out the "Syren" Force carried 61 horses and 21 mules. The mules were in excellent condition, but the horses were a poor lot.

During our stay at Murmansk the sun never set—daylight being perpetual. The Lascar crew petitioned the captain of the "City of Marseilles" to "take them away from this devil's country where there is no night. We shall all die as there is no sunset and we cannot pray to Allah."

Owing to a continuous north wind, the entrance to the White Sea continued to be blocked with ice, and the "Elope" party could not proceed until July 31st. Life at Murmansk was not made any more pleasant by the attentions of thousands of huge mosquitoes of the Culicidae variety. Further inland one met with Tabanidae of several varieties. They live around the numerous mountain streams that empty themselves into the Kola River. The mosquitoes and flies worried our animals considerably. The mules were one mass of lumps from the mosquito bites.

On July 20th, 1918, the "Kasala" arrived with 108 mules belonging to the 21st Battn. French Colonial Infantry. These mules were immediately disembarked. About 50 per cent. were in good condition; the remainder were poor. During the time we stayed in Murmansk, the sun never set, and we experienced the doubtful joys of perpetual daylight.

On July 30th, 1918, I supervised the embarkation of the mules on the "Kasala."

On July 31st, 1918, the "Elope" party sailed from Murmansk for Archangel. The convoy consisted of the "Stephen," "Asturian," "Kasala," several trawlers, and one old Russian torpedo boat manned by a British crew. An advance party consisting of the "H.M.S. Attentive," two transports, the French cruiser "Amiral Aube," and several small craft, had left some hours earlier.

Everything went well until about 4.30 p.m. on August 1st, when a thick fog descended on us, and as it was impossible to keep the convoy together, orders were given to anchor, which we did, and remained at anchor until 9.30 next morning. On August 3rd we arrived off

Midjuski Island at 9 a.m., and after a slight delay, proceeded up the Dvina. Three guns on Midjuski Island had been silenced early that morning by the "H.M.S. Attentive" and naval aircraft. Three miles up the Mimaxa Channel three ice-breakers had been sunk, but the attempt to block the channel was not successful.

As the convoy steamed down the river the peasants could be seen on both banks busily hay-making, being apparently indifferent to our arrival.

All parties were at battle stations. I had been given command of a company of ex-Russian officers, with one British N.C.O., and neither of us possessed more than a very rudimentary knowledge of the Russian language. We passed Archangel proper and proceeded to tie up at the Bakaritsa Quays, where the results of that terrible explosion in 1916 were still evident. After some time the "Asturia," "Kasala" and the "Westboro" followed us and tied up. We disembarked our party, but were soon given the order to dismiss, and with it went our hopes for a little excitement. The wharfage and storage here is excellent, but the enormous sheds which, but a few months ago were filled with munitions sent out by England had all disappeared, the Bolsheviks having carted them all away and sold them to the Germans. A whole train load of aeroplanes and spares was loaded up and ready to depart when we arrived.

The day before our arrival at Archangel a counter-revolution had taken place, and the Red Guards, after provisioning many river craft, had fled up the river. The party of Bolsheviks who had left by rail put up a defence about six miles from Archangel, but after being shelled by "H.M.S. Attentive" they were driven out by marines.

The mules from the "Kasala" were disembarked on August 4th, and tied up on lines erected at Bakharitza.

Owing to the shortage of British officers for the organization of the Russian recruits, at the General's request, I took on the duty of Recruiting Officer and Base Records, which duty I carried out until the first reinforcements arrived from England at the end of September. During this time I made a journey some 200 miles up the river, organised recruiting meetings at the larger villages, and when I handed over, had secured over 2,000 recruits for the Slavo-British Legion.

On August 21st it was decided to commence a transport section, and our first animals were selected from 10 animals which the Bolsheviks had left behind. Seven of these animals were taken. They were in a terrible condition, but in our hands they rapidly improved. The 1122 H.T. Coy. R.A.S.C. was built up from these seven horses. Several strays were collected, and in a very short time a number of useful animals were got together.

Mange appeared amongst the mules of the 21st Battn. French Colonial Infantry. Careful examination of them revealed five cases. The mules were in a poor condition, and owing to shortage of fodder, had been on very short rations.

On September 5th I proceeded to the railway front. Obozerskaya had just been taken ; all the transport was hired. Several villages were visited and a census taken of the horses, with a view to a subsequent requisition.

Obozerskaya is a small station some 90 miles from Archangel The headquarters were in two railway carriages, whereas there was, to quote from my diary, "an excellent railway house where the 1.0. and myself elected to sleep." It was now getting cold at nights and a large wood fire which we got going was especially welcome. Next morning after doing what work had to be done, I borrowed the O.C.'s rod and line and walked half a mile towards the forward positions where a decent sized stream was crossed by the railway. The fish rose well to the fly, and just when I was getting along famously the Bolshies were unkind enough to drop two shells into the river too close to be pleasant. Although I had only caught two fish (a variety of perch), I did not wait to put the rod in the case, but proceeded homewards. To quote from my diary,

" There is a large sized lake in this vicinity which one of the R.F.C., Epstein by name, is getting ship-shape for the use of seaplanes. During the night the Bolos attacked in force, having repaired the line and sent an armoured train against our blockhouse. Our armoured train went up, but the Bolos had gone when it arrived. Influenza was rife amongst the American troops and the mortality was very high. The next evening I left in a ' teplushkia ' (a fourth-class carriage). There were about forty occupants, mostly French soldiers going up to Archangel for a ' rest.' They had got an enormous fire going in the centre stove. All the windows were hermetically sealed, so the atmosphere can be imagined. Soon after I had got to sleep I was awakened by the bitings of thousands of bugs. Every carriage and every house in Russia teems with them. After several painful experiences I never slept in a bed, but put my blankets on the floor and drew a barrage of Keatings around me. Even when frustrated by my defences, they would proceed to the ceiling and drop down on to me."

On September 30th Capt. G. Barnett, Lieut. J. McAllan, and six veterinary sergeants arrived. Lieut. McAllan was detailed for duty with the Railway Force, whilst Capt. Barnett was retained in Archangel.

As the Force had been considerably augmented during the past

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three weeks, the question of horse transport arose. I took the matter up with the Russian Staff, and Lieut.-Col. Zancovitch with two other officers were appointed to look into the question of requisitioning, and to make the necessary arrangements to have the horses of the town brought to various points for examination. It was decided that we were to have first pick. At this time 40 horses were purchased by the Russian Staff and proceeded up the river with 18-pounders manned by Russian personnel. Whilst up the Dvina in September I purchased 17 ponies for Force " D," which was operating in the Seletskoe area.

Before proceeding further, it would probably be as well to describe roughly the dispositions of the various columns operating on the Archangel front. The map attached to this report will be of help. The Force was divided into three columns. One Force proceeded up the River Dvina and fought all the way until Beresniki was reached. This was made the Dvina Force Headquarters. The Force then split up into two parties: one party proceeding up the Dvina, and the other party up the Vaga, where Shenkursk was occupied.

The Vologda Column was operating on the railway which runs between Archangel and Vologda. Here our forward position was at Verst 455, a distance of 90 miles from Archangel.

A third Force was formed and was operating on the Yemetsa River. This Force was pushing in between the Vologda and Dvina Forces. Shortly afterwards an expedition was despatched to Onega and the Force operated on the Onega River. Our front then extended—commencing from the west—Onega, Obozerskaya, Seletskoe, Shenkursk, Dvina (Kourgomen).

As the demands for horses by the C.R.A. were increasing daily, further requisitions were made, and up to the arrival of a D.A.D.R. in February, 1919, I purchased every horse for the Force. The growth of the Force, as far as horses are concerned, is shown by Appendix " I."

The Russian Requisitioning Committee, under Col. Zancovitch, proved of the greatest assistance. Nothing was too much trouble for him. During the time this horse purchasing was going on, I travelled many hundreds of miles by sleigh in extremely bitter weather, examining, selecting, and arranging the collection of animals brought to collecting points by the Russian Commission.

When the cold weather set in and the Dvina was frozen all travelling was done with sleighs and ponies. The system of relays is well organised. One changes ponies at each village, the driver being paid by the local Zemstrov (council). In this way one can travel for 12 hours at a stretch, providing that there are not hitches or strikes amongst the drivers. It was very cold work driving during the months of

January, February and March. On March 18th I journeyed from Shred Mahregga to Siletskoe, a distance of 30 versts, departing at 4.30 p.m. and arriving at 8.30 p.m., the temperature being 79 below zero. A blizzard was blowing, but as most of the journey was through forest, the trees broke the force of the wind to a certain extent. But it was terribly cold, and I got slightly frost bitten on the face, in spite of the fact that I was wearing native costume (reindeer shuba, a large one-piece overall with a hole for the face, and varlinkee, thick felt boots). The equipment supplied by the War Office was absolutely useless for such journeys in this climate.

The pony of the northern region is a small, sturdy and compact animal, averaging from 11 to 14 hands high and weighing about 700 lbs. Predominant colours are bay and brown, but a large number of chestnuts are met with ; roans and greys are not common. Generally speaking, their conformation is good, but owing to extremely bad shoeing and chronic Hvorst poisoning the condition and shape of the feet is extremely bad. The toes are too long, and flat-feet are common.

These ponies are very hardy. They are usually stabled in barns adjoining or under the dwelling house. No rugs are used, but the coat is allowed to grow, and no grooming is carried out. If one of these ponies is well cleaned and groomed, on being brought into the open during cold weather—say 40° below freezing point Fahrenheit—it immediately commences to shiver, whereas an ungroomed animal does not appear to notice the intense cold. A peasant will drive 20 versts at a rapid trot and the animal will, at the end of the journey, probably be sweating. Some hay is thrown down in front of the pony ; no covering is put on him, and the owner disappears into the house to drink tea and transact his business. The sweat freezes on the pony, but the animal does not appear to be inconvenienced in the least, and takes no harm afterwards. One seldom sees a pony suffering from Catarrh.

The feed consists of a pood (36 lbs.) of hay daily ; oats being very scarce are seldom given. The hay is of a very inferior quality and contains much marsh grass and weeds.

The in-foal mares are worked right up to the last minute.

No Russian peasant waters his animal immediately after he has completed his journey, or a stage of his journey, whilst the pony is hot. They give a quantity of hay, and just before starting out again, give the pony as much water as it cares to drink. The peasants state that if water is given to a pony whilst hot, it causes an eruption around the coronary band which the frost gets into and causes local Necrosis accompanied by great pain and lameness. I am unable to prove or disprove this statement, but several gunner officers have told

me that they have had this trouble through watering their horses whilst hot.

The Russian Staff having appointed Lieut.-Colonel Taratin to be Chief Veterinary Officer to the Russian Forces, I met him and described to him our organisation. An interpreter translated the Veterinary Manual (War) into Russian for Lieut.-Col. Taratin's benefit. I have made many efforts to find out how exactly the Veterinary Department of the Russian Army is organised. It would appear that veterinarians have no rank, but are known as assistants, veterinary doctors, or assistant chief veterinary doctors. They carry a rank equivalent to lieut. and lieut.-colonel respectively, but are never addressed as such.

Owing to the shortage of veterinary sergeants for the Russian Artillery Units now forming, Lieut.-Col. Taratin approached me and asked if it would be possible for us to train Russians as veterinary sergeants, and to organise and train a small detachment of men to be used up country as a veterinary hospital under the command of a Russian veterinary officer. It was considered that a well-disciplined body of men, properly organised and equipped, would be of great value in the forward area.

A suitable building was selected at Smolny near Archangel, and after many meetings between the owner and the Billeting Committee, it was at last obtained.

A scheme was submitted to General Staff (Training) which was approved in Training Instructions No. 7 (PE/G/42/7)—a copy of which is attached as Appendix "II." The Instructional Staff consisted of--

1 Commandant and Chief Instructor. 2 Veterinary Sergeants as Instructors. 1 Farrier Sergeant.

The Russian Staff included two senior N.C.O.s, one interpreter, six other ranks for fatigue and transport duty, and one housekeeper.

The Course of Instruction for Feldshers (Veterinary Sergeants) was laid down as follows :—

> The Course will last from four to six weeks. Lectures and demonstrations will be given daily under arrangements to be made by the Commandant.
>
> All men under instruction will receive a thorough course of drill, and will complete a course of musketry at the Musketry School.

SYNOPSIS OF COURSE OF INSTRUCTION.

(a) General discipline; organisation of the Veterinary Service, etc.; Clothing and Equipment; Pay;

Veterinary Equipment with each unit in the field; Hygiene, grooming, and general stable management; Feeding and watering.

(b) CARE OF THE SICK AND INJURED.

Appearance of an animal in health, normal pulse, temperature, etc.; Special feeding of the sick; Invalid foods and their preparation; Administration of medicines; Destruction of animals; Disinfection of stables, rugs, and ironwork; Disposal of carcases.

(c) NON-CONTAGIOUS DISEASES. (d) CONTAGIOUS DISEASES.

(e) DEMONSTRATIONS, including :—

Grooming; Administering medicines; Securing animals; Casting for operation; Examining feet, teeth, sheath, etc.; Testing and taking of scrapings for Mange; Dressing wounds.

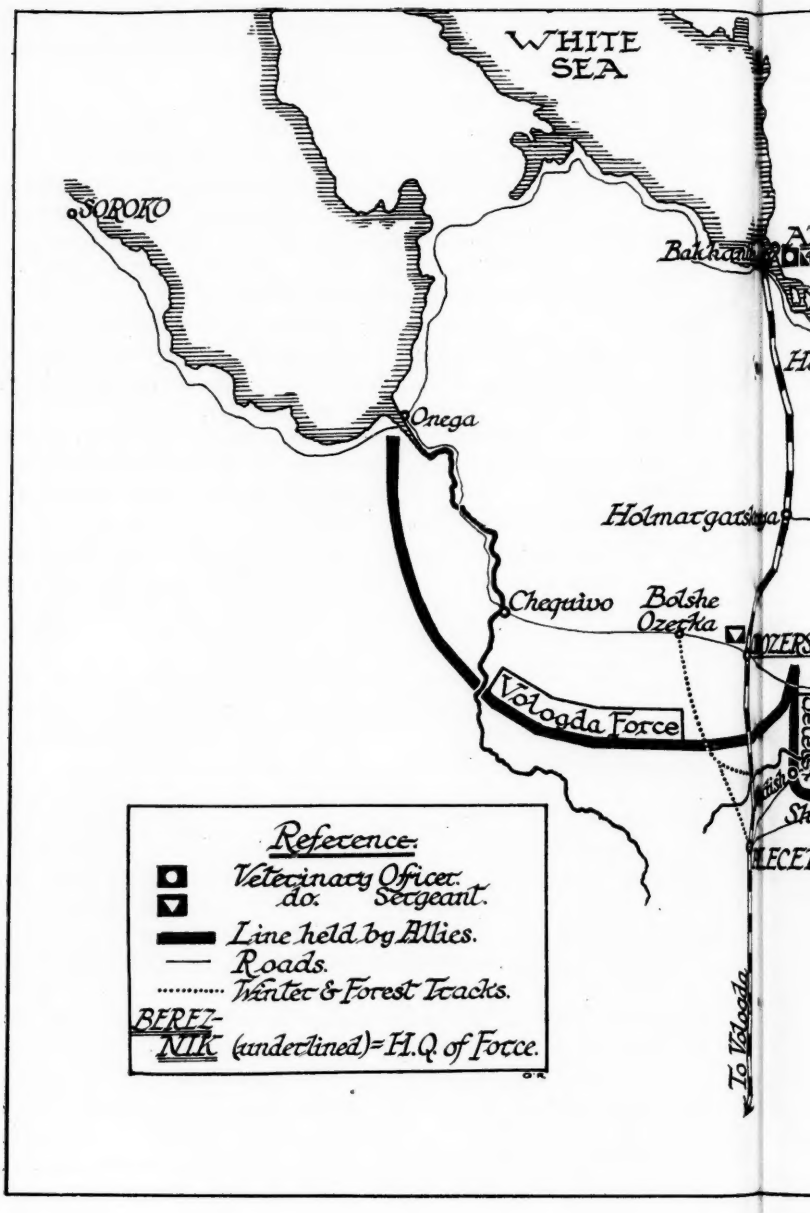
The whole scheme was put before the Russian Assistant Chief Veterinary Surgeon for his approval. After much correspondence and discussion I interviewed the Russian Chief of Staff—General Samarin—who approved of the scheme.

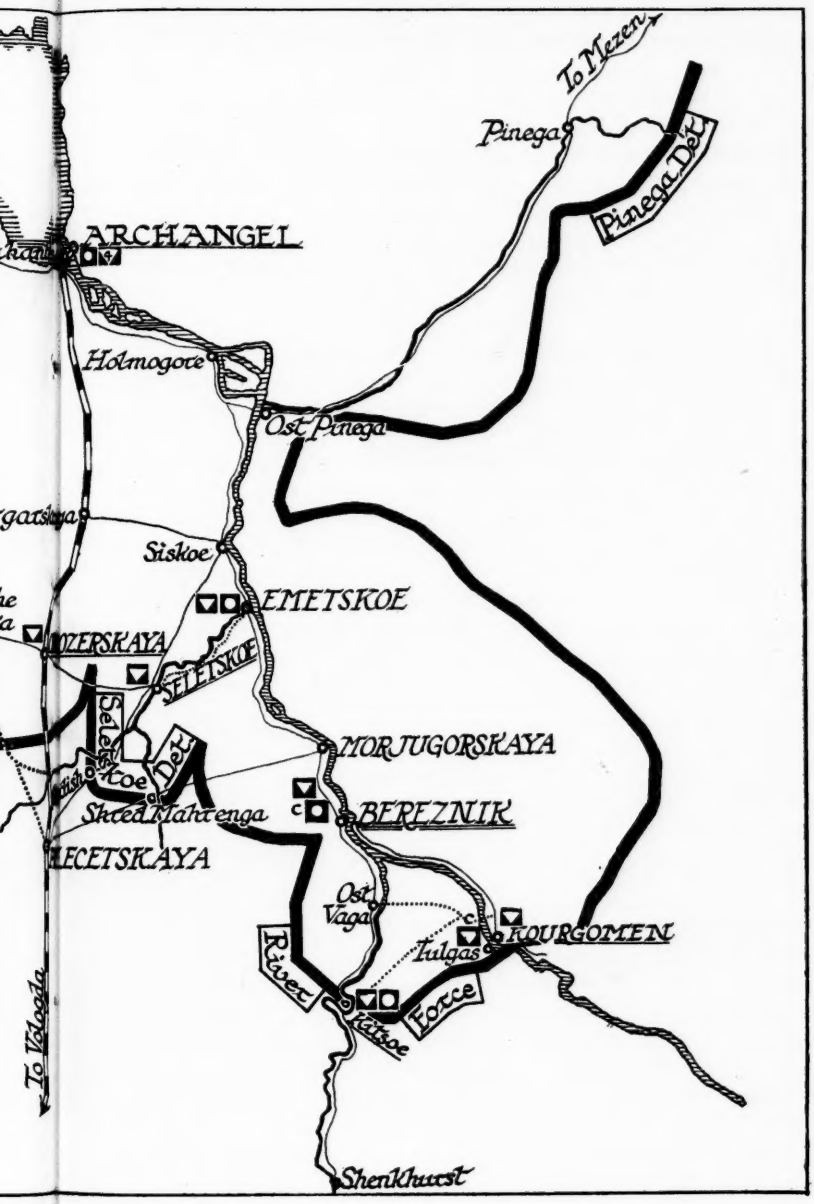
The building at Smolny was finally handed over. Electric light was installed. Ablution benches, latrines, and incinerator erected, and on December 12th, 1918, Capt. G. Barnett, M.C., moved in with his British staff.

The School was actually opened on December 14th, 1918, and on this date the Russian personnel, who formed the staff of the School, arrived. In a report on the formation of the School, the Commandant, Capt. G. Barnett, states :—

" Anyone who was not here at the time, and is used to our own British Army methods, would find it well-nigh impossible to believe the circumstances under which these men reported. The men's kit was scattered apparently all over Archangel and district, and I had to grant leave from five hours to three days to enable them to collect their belongings. The Clothing Statements which accompanied them were blatant in their inaccuracy, whilst the ' duplicates ' in very few cases corresponded with the originals. Needless to say all the correspondence was in Russian, and the translation and correction of mistakes involved a tremendous amount of labour.

" Simultaneously with the preparation of the School, I was organising the Base Veterinary Hospital for which purpose I took over a long, very dirty, shed, in very imperfect repair. All the details of organisation, orders, and so on, had to be prepared in English and Russian.


WHITE SEA
SOROKO
Onega
Holmargatsya
Chegnivo
Bolshe Ozerka
Vologda Force
To Vologda
Reference.
Veterinary Officer.
do. Sergeant.
Line held by Allies.
Roads.
Winter & Forest Tracks.
BEREZ-NIK (underlined) = H.Q. of Force.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MORJUGORSKAYA
BEREZNIK
Skred Mahrenga
Ost Vaga
KOURGOMEN
Tulgas
River
Force
To Vologda
Shenkhurst

"I will deal with the organisation of the Base Veterinary Hospital separately, and for the moment confine myself to the working of the School.

"On December 17th, 22 men arrived to form the nucleus of the 1st Russian Mobile Veterinary Section. The majority of the men had little or no previous service in the army, and knew nothing of discipline. About 50 per cent. of them were unable to read or write. Of the two Russian N.C.O.s on the Staff, and the two N.C.O.s who came with the Section men, I had to place three under arrest, and to punish and remove them from the School within a fortnight of their arrival.

"The system of instruction that I adopted was as follows:—

"The Section was detailed each week into—

"(a) *Grooming Party*.—These men had to groom the horses thoroughly under my supervision, or that of an N.C.O. They were also responsible for the cleaning, watering, and feeding.

"(b) *Dressers*.—This party went round all the cases in the Hospital with the N.C.O. in charge, and assisted him generally, and received instruction in the rudiments of the art of dressing.

"(c) *Stable Orderlies*.—These men had to remain in the stable during meal times.

"All the men went to the Hospital in the mornings and carried on their work in one of the above parties. Each man was on one of these duties for a week at a time.

"In the afternoon the men were given a lecture on stable management, elementary Veterinary work, or were drilled. After that they again returned to Hospital to water and feed the horses.

"When this had been done they had tea, a final parade on which all orders were read out, and were then free until 10 p.m., with the exception, of course, of the Stable Picquet which mounted at 5.50 p.m. nightly.

"Previous to taking over the School I wrote out a course of lectures which were translated into Russian by Mr. Moncur. . . . I would take the opportunity of emphasising the fact that the translation of these lectures was a laborious and difficult task, especially when one bears in mind the number of technical terms which occurred therein. Mr. Moncur not only translated these lectures, but typed them in Russian, and they have been of the very greatest assistance in the School to me.

"On January 19th, 1919, my interpreter, Sergt. Martigny, was evacuated to England, and Mr. Lingard, of the British Food Supply

Mission, consented to act as interpreter for me. Mr. Lingard was a C.S.M. in France for some two years, and has been of the greatest assistance to me in disciplining the men.

" On January 22nd Veterinary Surgeon Titoff, of the Russian Veterinary Service, reported for duty to receive instruction in the command of a Mobile Veterinary Section. Needless to say, during the course of instruction we had a certain number of casualties amongst the men in the section, owing to cases of sickness, etc. Gradually the discipline amongst the men became better and better, until finally I do not think that the keenest critic could have found much fault with them. Cases of crime were very few and far between, and never very serious.

" By adopting the system I have mentioned above, all the men received training in grooming, stable management, dressing, handling of horses, in addition to drill and musketry. I also arranged for the men to fire a musketry course, which was done. I made out a mobilisation store table for the section and obtained the stores, and all deficiences of kit amongst the men were made good. Four transport horses and sleighs were drawn, and one horse additional for Veterinary Surgeon Titoff. Before leaving, the section was inspected on March 24th by General Miller, the Russian Quartermaster-General, who, I understand, expressed himself highly pleased. Unfortunately I was unable to attend this last parade as I had been admitted into hospital three days previously, suffering from appendicitis.

" The Section left for the Front on March 25th, 1919, consisting of the following :—

Veterinary Surgeon Titoff, Feldsher Ivanoff, Starchu Unter Off : Karellin (Senior N.C.O.), Malodchu Unter Of : Lebedyeff (Junior N.C.O.), Malodchu Unter Of : Oustenoff (Junior N.C.O.), Privates (20), Farrier Karellski, Clerk Leseetzin.

Total : 1 Officer and 26 other ranks.

Considerably more men have been in the School for varying periods, but have not completed the course owing to sickness, etc.

" That a Veterinary (Officer) Surgeon should be given command of the Section was quite an innovation—previously no Veterinary Officer had commanded a unit in the Russian Army.

" While he was at the School, V.S. Titoff lived in the mess with me. He saw everything that was done, and lectured to the men himself. He thus had the opportunity of witnessing the formation and organisation of the Section and becoming personally acquainted with the men he was to command. In view of the fact that all the clerical work of the Section would have to be done according to Russian standards, I was very careful to see that he was made acquainted with their method

XUM

of accountancy by Russian Headquarters. In short, therefore, when V.S. Titoff left he was in command of a unit thoroughly disciplined, armed, and equipped. He himself had been given every opportunity of learning his duties as commander of the unit, and on him now largely devolved the responsibility of breaking down the old Russian idea that a Veterinary Surgeon was not a competent person to be in charge of a unit.

" I would like finally to place on record the excellent work done by No. SE.4623 Staff-Sergt. P. J. Cooper, R.A.V.C., as senior N.C.O. in the School. Although handicapped by his inability to speak the language, Staff-Sergt. Cooper exacted a high standard of discipline from the men and earned their great respect. He was very tactful and full of initiative.

" After the Mobile Section had left for the Front, Russian personnel were sent to the School for one of three purposes :—

" (a) To be trained as Veterinary Sergeants (Feldshers).
" (b) To be trained as Cold Shoers.
" (c) To assist in the work of the Hospital, and to learn Stable Management.

I had then eight Feldshers, three Cold Shoers, and 10 men learning Stable Management.

" Lectures were given daily whenever possible. Practical instruction was provided every day at the Hospital.

" The men reported on various dates, so that the time is not sufficient to show much result. The men seemed keen on their work, and I had little doubt that in a short time they would be able to perform efficiently those duties in which they were receiving instruction.

" I would conclude by expressing the opinion that little or no good will be done by hastening the Courses. My experience has been that the best results accrue from slow methodical work. The average Russian soldier, such as I had, was only capable of learning and understanding a few facts at a time. The lectures had to be very short and simple, and not given too often ; otherwise the men got confused.

" I consider that a Feldshers' course should last at least three months. That is the least time that a really keen man could be sent to a Unit with the feeling that he would be a credit to the School."

Capt. G. Barnett, M.C., Commandant, Veterinary Training School in a report on the Base Veterinary Hospital dated April 23rd, 1919, states :—

" After about a fortnight's preliminary work, the Base Veterinary

Hospital was opened for the reception of cases from all Russian and Allied Units on January 1st, 1919.

"The Hospital, as taken over on December 14th, 1918, consisted of a long shed in imperfect repair, and very cold. The R.E. Coy. made certain essential repairs, and, as soon as these were completed, the Hospital was opened. Improvements have been going on ever since. An operating room has been made, electric light installed, a surgery constructed with double walls, stoves and windows fixed, a forge established, partitions and loose boxes constructed, etc. etc. Much can still be done, but at any rate, the Hospital is at least in a very sound workable condition. Recently three more stables have been taken over, and so now we can accommodate from 130 to 200 animals, depending on whether one puts one or two animals in one stall. No. Reg. 445 Sergt. R. J. Verion, R.A.V.C., has been the sole British N.C.O. in charge up to the time of the arrival of Staff-Sergt. Watts. This N.C.O. has shown conspicuous industry. He has handled the Russian soldiers firmly and tactfully, and has spent much of his spare time in effecting improvements in the Hospital. There is also, at the Hospital, Corpl. Boukreyeff, S.B.I., who has been training under Sergt. Verion since January 25th. This N.C.O. has shown great keenness and aptitude, and is now a valuable assistant. Though very young, he is a very good disciplinarian, and capable of instructing beginners.

"The Cold Shoers' Class is being instructed by Shoeing-Smith Bougaeff, who was mobilised on March 3rd. This man is very industrious, clever with his hands, and a good instructor. The Feldshers' Class works directly under the British Staff of the Hospital and Corpl. Boukreyeff, as do the men under training in Stable Management.

"Since its inception the following is the number of cases:—

January	.. ..	27 cases
February	.. ..	17 ,,
March	.. ..	17 ,,
April (1st to 21st)	..	60 ,,

Of these animals one died, three were destroyed, and one was cast for sale. There remain at present under treatment 75 horses and one mule. Of these 30 are ready for discharge to the Convalescent Horse Depot as soon as it is opened.

"The large number of animals admitted this month is accounted for by the fact that large numbers of animals returned from the Front as soon as the thaw came. The roads were very bad, indeed, and consequently there was much debility and consequent ailments."

XUM

Below is given the time table as adopted at the Veterinary Training School and Base Veterinary Hospital :—

6.30 a.m.	Reveille.
6.50 a.m.	Parade.
7.0 a.m.	All men to be at Hospital.
7.45 a.m.	March back to breakfast.
8.30 a.m.	Breakfast.
9.0 a.m.	Parade and march back to Hospital.
10.30 a.m.	Stable Orderlies return from breakfast.
11.45 a.m.	Mid-day stables commence.
12.30 p.m.	Parade outside Hospital and march back to School.
1.0 p.m.	Dinner.
2.0 p.m.	Dressers parade and march to Hospital. Horsemen and spare men parade for musketry, lecture, or drill.
3.0 p.m.	Stable orderlies return to Hospital.
3.30 p.m.	Horsemen and spare men march to Hospital.
4.15 p.m.	Parade and march back to School.
4.30 p.m.	Tea.
5.0 p.m.	Parade for orders to be read out.
10.0 p.m.	All in.
10.30 p.m.	Lights out.

December 7th, 1918. The animal strength was now daily increasing, and more assistance was required. An establishment was put forward to D.A.A.G. on December 10th, and was approved by the War Office on January 17th, 1919.

ESTABLISHMENT.

(*Authy : W.O. Cable* 451 *dated January* 17*th*, 1919.)

A.D.V.S., 1 ; D.A.D.V.S., 1 ; Officers, 4 ; Sergeants, 11 ; Privates, 3.

Having no executive Veterinary Officer in Archangel, I had myself to attend to numerous units training in Archangel and Bakharitza, including a French 75 mm. battery at Archangel Prestan and Fren : 21st Colonial Infantry Battalion. The latter had many cases of Mange, and after the Armistice was signed they would do absolutely nothing to help themselves. Stabling was procured for them, wood, boxes for mangers, grooming utensils, etc., but in spite of all our attention the disease continued to spread. It was obvious that a separate building away from their main stables was required where affected animals could be isolated and treated. Eventually such a stable was procured, and 21 affected animals thus isolated and treated.

Our efforts met with success, and in two months only one case remained under treatment, and no further cases occurred at the main stables. The buildings and harness were disinfected by one of our Veterinary Sergeants.

On December 19th, 1918, I interviewed the President of the "Commission for the Requisition of Horses against Payment" with a view to accelerating the purchase and collection of horses for the British Forces. Another Commission was appointed and commenced to work along the Archangel-Onega road. 110 horses were eventually selected and purchased by the commission for us in this particular district.

The roads now having become suitable for sleigh transport, a large number of peasants and their horses were requisitioned to convey food and material from the railhead at Holmogorskaya to the Headquarters of the River Force at Beresnik. In a month's time over 1,000 sleighs were working on this road.

In order to control contagious disease amongst these animals I arranged with the Zemstra Uprava (District Council) Veterinary Surgeon at Emetskoe (Advanced Base) to examine all these animals as they passed through. Several cases of Mange were found and isolated.

At the end of December it was reported to me that 40 per cent. of the horses working with the Dvina River Column on the left bank were suffering from Hvorst poisoning. Horse or Mare's Tail (Equiseta Pelustrum) is a weed which is found in marsh grass. As practically all the hay in the country is marsh grass, Hvorst is found in practically all samples. It is a cumulative poison, but if oats are given and the animals are not worked too hard, no evil results are seen. Symptoms are partial posterior paralysis, as evidenced by unsteady action and a swaying movement when the animal is walked. Symptoms resembling Laminitis are also often met with. The temperature is raised, and pulse and respiration accelerated. The animal is very excitable.

TREATMENT.—An aloes purgative followed by daily injections of Strychnine for 9 or 10 days gives excellent results.

The active principle of the plant is said to be an alkaloid. On making enquiries, I found that the horses on the right and left banks of the river had been receiving the same variety of hay, but owing to difficulties of transport the horses on the left bank had not received any oats. Arrangements were made to supply them with oats, and after receiving a supply, the disease stopped. Two animals succumbed from the acute variety.

On January 13th, 1919, four R.A.V.C. Sergeants arrived at

XUM

Archangel from England. Their arrival was very welcome as we were very badly off for skilled men.

On February 14th I proceeded on a tour of inspection of the Seletskoe and Dvina Forces. I travelled 782 versts by sleigh, and was away from Headquarters for 15 days. Every horse was seen by me.

After the evacuation of Shenkursk, Lieut. J. McAllan, R.A.V.C., had moved back with the Force, and had taken up his headquarters at Kitsa on the Vaga River.

Sergt. G. Dowding was R.A.V.C. Sergeant in charge of the Dvina Column, and had done excellent work. With a section of the 67th Batty. C.F.A. was Veterinary Sergt. Frape who, during the attack on Tulgas on November 11th, organised the 36 drivers and defended the village against 300 Bolsheviks. For this deed he was awarded the D.C.M. by the Commander-in-Chief.

All the horses with the artillery were in excellent condition, but the transport horses, owing to little food and heavy work, were in very poor condition. The ration laid down for these ponies was 12 lbs. hay and 10 lbs. oats—1 lb. of oats being equivalent to 2 lbs. of hay.

Through the campaign we have had plenty of oats, but hay has been very scarce. 18 lbs. hay and 7 lbs. oats is a much more suitable ration for these animals. It is a moot point whether it would not be better to feed hay entirely, for owing to the food shortage amongst the civilian population, it is doubtful if any of the oats entrusted to Russian drivers ever get as far as the horses.

Owing to the demands of the River Forces for food and munitions, in order to be prepared for the transition period between the thaw and the opening up of the river for navigation, ver ylittle transport could be allotted for carrying oats. The ration of oats for first line transport in the above-mentioned Forces seldom exceeded 3 lbs. per day, and hay 10 lbs. This state of affairs was due to the fact that the original "Elope" G. Staff informed the A.D.S. & T. that no horses would be used for the campaign. Fortunately the A.D.S. & T. used his own judgment and sent 200 tons of oats up the river to Beresniki just before navigation ceased, but had he been more correctly informed, he would have sent a far greater quantity to the River Column.

Lieut. B. Carmichael, R.A.V.C. arrived at Archangel on February 12th, 1919, and was posted to Emetskoe as Veterinary Officer i/c Seletskoe Detachment, and to supervise the hired transport. He had only just settled down when Capt. G. Barnett, M.C., was taken ill, and I had to send Lieut. B. Carmichael to Kitsa to take over from Lieut. J. McAllan, who returned to Archangel to take charge of the School and Hospital during Capt. Barnett's illness.

On March 22nd a Course of Cold Shoeing was started at the Veterinary Training School. A very good Russian Farrier was supplied by the Russian Staff as an instructor. Complete lectures on the Foot and Shoeing were drawn up and translated into Russian for the use of the students.

On March 24th Major-General Miller, Governor-General of the Northern Region, paid a visit to the School and inspected the 1st Russian Mobile Veterinary Section prior to their departure for the River Front. The General expressed great pleasure at the smart appearance of the men and the good work the School was doing.

Owing to the scarcity of food in the Archangel district, it was found that a large number of useful animals were being killed for food. I represented this fact to the local government, and we came to an arrangement whereby every animal destined for slaughter was examined by us, and if found serviceable, was purchased by the Requisitioning Committee.

From the time of our arrival in the country until April 14th, 1919, when Lieut.-Col. B. L. Lake, D.S.O., R.A.V.C., arrived to take over from me, we have had very little contagious disease to deal with. Mange only appeared when 37 horses captured from the Bolsheviks in November were allowed to mix with clean animals. Owing to the difficulty of treating these cases I destroyed them all. Two cases were subsequently discovered on the Railway Front, one of which was destroyed.

Two cases of Strangles were found in the French 75 mm. Battery in March, both of which made a rapid recovery. There has been no Glanders, Ulcerative Cellulitis, or other such diseases which have caused such havoc on other Fronts.

Hvorst poisoning has been our worst enemy, but this has only caused four deaths all told amongst the whole Force. 31 horses have died or been destroyed, 17 of which were killed in action, and seven captured horses destroyed on account of incurable Sarcoptic Mange.

The inferior harness and mode of traction has been a great trouble. Some units at times had 30 per cent. of their animals out of action on account of collar galls. Those units that procured P.D.G.S. harness had little or no trouble.

A Base Veterinary Stores was established at Archangel, but the stores which were indented for in August and September, 1918, did not arrive until February, 1919, and then only 76 cases of the 135 which were dispatched from Woolwich. 76 of these cases are still held up at Murmansk.

During the period under review the whole of the Officers and other ranks of the Corps have done their best, and I cannot speak too highly

of the services rendered by those Officers and men who have endured the rigours of a very severe winter, and have existed under conditions that have probably never before been met with.

All the Officers of the R.A.V.C. have received Russian Decorations, and one has been conferred on No. SE. 4623 Staff-Sergt. P. J. Cooper, who has acted as Sergt.-Major at the Veterinary Training School. No. R.231 Sergt. T. Mileman was awarded the Meritorious Service Medal for excellent services rendered when he brought 200 horses from Mezen to Archangel, a distance of 400 miles, with only 37 raw Russians to help. Staff-Sergt. Cooper's name for a similar award has been forwarded to England.

I attach a list of all Officers and other ranks, Royal Army Veterinary Corps, who were serving with the " Elope " Force prior to the arrival of Lieut.-Colonel B. L. Lake on April 14th, 1919.

Reindeer.

A few words on reindeer may be of interest. During the operations in Pinega area during March, 1919, 600 reindeer were used for transport purposes from Archangel to Pinega—a distance of about 200 versts—with great success. Taking into consideration the bad state of the tracks and the nature of the loads, the fact that there were no casualties was remarkable.

Reindeer are only used in the winter, to pull sleighs. The sleighs are very lightly built, and do not weigh more than 36 lbs. A reindeer can pull about 200 lbs., but this is a large load and cannot be pulled for any considerable distance. Two animals are harnessed into one sleigh. A convoy usually consists of from five to ten in sleighs, each drawn by two deer. These are driven by one man who sits in a separate sleigh drawn by four deer. A convoy of this description is known as an Argesh. Several of these Argesh are known as a Netpoye. The harness consists of a light collar with a rein attached to the bottom of it running down between the fore legs, along the belly, between the hind legs, through a ring which is attached to one of the runners, along through a second ring, up between the hind legs and fore legs of the second deer, and then is attached to the collar. The inside of the hind legs at times gets rubbed by the strap, and skin diseases in this area are caused as the result. Psoroptic Mange is said to exist in the spring, but does not cause a great deal of trouble. As mentioned before, the sleigh weighs about 30 lbs. to 45 lbs., and 6 ft. long, and 2 ft. wide. The carrying surface is 18 in. from the ground. The widest part of the sleigh is the runners.

Food.—The staple food is Moss (Beiley Moch). Reindeer will work from 8 a.m. to 8 p.m. A convoy usually travels about 5 versts,

draws up for about 10 minutes for a rest, and then goes on again. They carry on this procedure for about 12 hours. Sometimes at mid-day they will stop for about an hour, but this is done more to accommodate the driver than the animals.

NUMBER OF DEER IN ARCHANGEL GUBARNEA.—Lieut.-Col. Taratin estimates that in 1907 there were in the Archangel Gubarnea 500,000 reindeer. A very severe epidemic of Anthrax caused about 200,000 deaths about this time, but by now, 1918, they may have regained their original strength, or perhaps exceeded it. The Samoyeds castrate all the bulls, except about 1 to 2 per cent. There is no selection or attention paid to in-breeding.

DISEASES OF REINDEER.—No complete or exact knowledge on this subject exists. I have talked with Russian Veterinary Surgeons who have spent years amongst reindeer, but their knowledge appears to be superficial. This is mainly due to the fact that they only travel amongst the Samoyeds in the winter when travelling is easy and comfortable. The discomforts of summer travelling appear to cause them (the Veterinary Surgeons) to migrate to the nearest town and stay there until the winter comes. Practically nearly all the worst diseases which affect reindeer are met with in the summer, as one would naturally suppose. It is known that Piroplasmiosis exists amongst reindeer, but not one Russian Veterinary Surgeon could tell me that he had ever seen a tick, as all their travelling and advice was given in the winter time when ticks would not be present. The most common diseases are said to be brought on by exhaustion. Of the specific diseases Anthrax causes the greatest number of deaths. The disease affects them very suddenly. The localised form is rare. Serum and Vaccine Treatment is very efficacious. Both these products are manufactured at the Veterinary Laboratory at Archangel. Unfortunately they do not appear to have any means of standardisation of their Serum, and I saw their Serum that was made in 1914 being issued.

Piroplasmosis is seen in the summer, and is called Spleen disease by the Samoyeds. It causes a number of deaths, but the majority of deer get an immunity when young. It is only when they are over-driven or some other factor arises that lessens their power of resistance, that the disease gains a hold on the animal, and produces a fatal result. In the summer Warbles of the Hypoderma Bovis type are very common, and become so bad at times that the death of the animal is caused from Septicaemia.

Foot and Mouth Disease (Rilnor Korpwetnaya Boleznis) is endemic but causes little loss. It is most common in late summer and autumn. There is a specific disease peculiar to reindeer and called by the

Samoyeds, Guish Potem. It is inflammation of the tissues surrounding the third phalanx. The word translated into English means Hoof Disease. It commences by lameness followed by swelling round the coronet. The inflammation shows first in the cleft of the hoof, then it affects the whole leg, causing elephantiasis, and if in the front leg, may cause death by its action on the heart. Lieut.-Col. Taratin states that suppuration takes place inside the hoof, and occasionally it breaks out at the coronet or slightly higher. The cases that I have seen appear to be a kind of Bacillary Necrosis, and bear no relation to suppuration inside the hoof. Some say the disease is due to wounds produced by the stiff grass growing by the seaside. An infected herd travels over this grass and another herd following after gets infected. An organism of a bipolar type has been isolated, and I am assured that injections of a culture of this Pasteurella will cause typical lesions of Hoof Disease in kraaled deer. This disease causes greater loss than anything else. Inflammation of the lungs in the young is common, but is not of a contagious type. It is seen in the early spring.

Operations on the Murmansk Front.

The operations on this front were conducted by a force known as the Syren Force, the object of which has been mentioned previously. When the "Elope" Force left for Archangel, the "Syren" Force became a separate force and quite independent of "Elope" as far as veterinary administration was concerned. There was no Veterinary Officer with this force from the time I left for Archangel until Lieut. Alex Ewing, R.A.V.C., arrived with the 6th Brigade R.F.A. in September, 1918, and on his arrival found a lot of sickness amongst the 75 English horses that were doing transport work. Lieut. Ewing was attached to an Animals Purchasing Commission whose object was to purchase Russian ponies and sleigh dogs. Very few of the latter were procurable, but ponies were plentiful. These ponies were dispatched as soon as possible to the different units. The purchasing was done chiefly around Kem, Soroka and as far afield as Solovetski Island in the White Sea. This island gained later notorious fame as a Cheka prison under the Bolshevik regime (See the "Red Terror" and "The Cheka" by Georges Popoff).

Owing to the failure of obtaining suitable dogs locally, some 500 were imported direct from Canada in charge of Capt. Kelly and several French-Canadian drivers. To quote from Lieut. Ewing's diary: "After about six weeks with the Purchasing Commission, I returned to my unit and took over all animals in Kola and Murmansk, with periodic inspections of civilian and military horses along the whole line from Murmansk to Soroka until about Christmas time, when Lieut. Davidson

arrived and relieved me of the line from Kem to Soroka inclusive of the garrisons. In February Lieut. Kelly arrived and took over Murmansk, with the result that I was left with a line from Kola to Kem approximately 500 miles long. In addition to the ponies I had about 1,000 reindeer to look after. This line I continued to work with five Veterinary Sergeants, a field chest and a few drugs the A.D. of S. & T. obtained for me."

As the other two veterinary officers were unattached, they were attached to the R.A.S.C. for administration purposes. The force remained there until September, 1919, when it was evacuated.

APPENDIX "I."

Table showing growth of animal strength operating with the "Elope" party of the N.R.E.F. from August, 1918, to March, 1919.

Date.	Horses.	Mules.	Russian Authorities and Hired Ponies.
1918.			
August	40	108	Nil.
September ..	57	113	Nil.
October	250	138	380
November ..	688	138	384
December ..	1,061	120	759
1919.			
January	1,217	115	1,330
February ..	1,253	115	1,336
March	1,228	115	2,379

APPENDIX "II."

PE/G/42/7.

TRAINING INSTRUCTIONS No. 7.

PROVISIONAL ESTABLISHMENT.

VETERINARY TRAINING SCHOOL, ARCHANGEL.

1. The object of the School is :—
   (a) To acquaint Russian Veterinary Surgeons with the organisation of the Allies' Veterinary Services.
   (b) To train Russians for the duties of Veterinary Sergeants.
   (c) To train and equip Mobile Veterinary Sections.
   (d) To train Russian farriers in Cold Shoeing.
   (e) To train and equip the nucleus of a Russian Veterinary Hospital.
2. *Instructional Staff.*
   (a) 1 Commanding Officer ; (b) 2 Veterinary Sergeants (British) ;

(c) 1 Farrier Sergeant (from Artillery or A.S.C.) ; (d) 2 Russian N.C.O.s (ex-Cavalrymen) ; (e) 4 Privates, S.B.L. (for Labour duties) ; (f) 1 Orderly ; (g) 1 Interpreter (Grade B).

3. *Stores and Equipment for the School.*

The following indicates general stores which will be part of the School Establishment.

(a) Veterinary Equipment.

(b) Cooking and heating arrangements (dixies, etc.) for 100 N.C.O.s and men.

(c) Bunks, palliasses, etc., for 100 N.C.O.s and men.

(d) Mobile Equipment (2) Limbers, (4) Headcollars, Rugs, etc., for 42 horses.

(e) Hospital equipment for 500 animals.

(f) Farrier Section.—Chests : tool, filled ; Carpenters' ; Farriers' and Shoeingsmiths' ; Panniers', Saddlers' ; Anvils ; Blocks ; Aprons ; Bags, tool, farriers' ; Forges, field ; Hammers, knives, etc. ; Knives, drawing.

(g) Tables, desks, etc.

(Signed) L. NOTCUTT,
Major, General Staff.

G.H.Q., Archangel.
October 26th, 1918.

APPENDIX "III."

List of Royal Army Veterinary Corps Personnel serving with "Elope" party of N.R.E.F. before the arrival of Lieut.-Col. B. L. Lake on April 14th, 1919.

OFFICERS.—Major F. Chambers, Captain G. Barnett, Lieut. J. McAllan, Lieut. T. Hungerford, C.A.V.C., Lieut. B. Carmichael.

OTHER RANKS.—SE.4623 Staff-Sergt. Cooper, P. J. ; Reg. 231 Sergt. Mileman, T. ; Reg. 445 Verion, R. J. ; TT. 0130 Ball, G. H. ; TT. 0137 Hollingshead, M. ; SE. 17432 Dowding, G. ; TT. 02608 Goodall, P. ; TT. 01161 Kay, J. A. ; TT. 01261 Wing, W. B. ; SE. 9498 Watson, W. C. ; SE. 18779 Sutcliffe, F. ; TT. 01074 Walton, P. G.

ORDER TO RUSSIAN TROOPS IN THE NORTHERN REGION.

No. 33.

FEBRUARY 1ST, 1919, AT ARCHANGEL.

At different times I have visited the Machine Gun, Musketry, Bombing, and Veterinary Schools, organised by the Allied Command. In these Schools the Russian officers and soldiers receive the very best special training, and as to interior order, discipline and care

about them, they are in conditions which can be called ideal. In the name of the Russian Army being formed in the Northern Region, I beg Col. Moore, Major Tippets, Major Gould, Captain Major, and Major Chambers to receive our sincere thanks for their work.

(Signed) MAROUCHEVSKY,
Major-General, General Staff,
Commander Forces.

ORDER.
RUSSIAN TROOPS OF NORTHERN DISTRICT.
NO. 88.

MARCH 22ND, 1919, ARCHANGEL.

In reward for special services in the strife against the enemies of Russia in the Northern District, for distinguished service in the field and for services connected with the re-organisation of the Russian Army—by virtue of the authority vested in me by the Provisional Government, I award the following :—

ORDER OF ST. ANNE, 2ND CLASS WITH SWORDS—*British Army.*—Colonels : Richard Crawley, and Charles Fisher. Lieut.-Cols. : Reginald Major, Henry Monk-Mason, Sutherland, Jocelyn, Trench, Frank Moore, R. Stokes, I. Graham, James Delahaye, Thomas McDermott, Courtney ; Major Cecil Tippets and Captain Major.

French Army.—Battalion Commanders Vitré, and Litchfers, Lieuts. Mussi, and de Lutersak.

ORDER OF ST. STANISLAV, 2ND CLASS WITH SWORDS—*British Army.*—Majors : Boutfleur, Philip Carter, Harry Cotley, Reginald Fitzgerald, S. Mohr, A. Rork, A. Skeyl, F. Arnoldi, A. Fortescue, W. Hyde, R. Smith, O. Body, J. Conway-Brown, Frank Chambers, James Smith and W. Lynch. Captains : George Barnett, R. Smerdon and Paul Mills.

French Army.—Captains : Juan, Bouayet, Michle, Gentil, Ayli and Dion.

ORDER OF ST. ANNE, 3RD CLASS WITH SWORD AND BOW—*British Army.*—Captains : J. Bruce, W. Poore, J. Perkins, A. Bright, W. Reber, L. Hodson, and D. T. Evans. Lieuts. : Richards, Nield, C. Cooper, J. Dicks, Roger Hutchinson and G. W. Winslow.

French Army.—Captains : Male, Andre and Barbotts. Lieuts. : Marcel de Morin, Breson and Lussi. Doctor Lémuen.

United States Army.—Captain Moore.

ORDER OF ST. STANISLAV, 3RD CLASS WITH SWORDS AND BOW—*British Army.*—Captains : A. Brown, L. C. Volt. Lieuts. : Murray, J. McAllan, J. B. Swanston, W. Watson, W. Rhodes and E. Watts.

Czecho-Slovak Army.—Lieut. George Broge.

XUM

ELECTRO-THERAPY IN CANINE PRACTICE.

By E. MIDDLETON PERRY, C.B.E., F.R.C.V.S.,
*Wimbledon, S.W.*19.

HAVING been very interested in Electro-Therapy as carried out in the medical profession for some considerable time, I considered that there was no reason why we should not get very beneficial results if the same treatment was accorded to our patients. It has, therefore, been with great interest that I have tested various forms of electrical treatment, and I must say that the results have far exceeded my expectations.

The various forms which I have used up to the present have been the High Frequency, Ionic Medication, and Ultra Violet Radiation. I have now complete sets of the latest patterns of apparatus for their application to the dog and cat, and am using them regularly on every suitable opportunity.

HIGH FREQUENCY.—The current used for this is, as the term denotes, of a very high frequency, and the apparatus required is of a simple nature and supplied by any electro-medical firm of manufacturers. The current used is an alternating one and can be obtained from most main supplies; the frequency of which, as given to the patient, approximates one million alternations per second. It does not stimulate the sensory nerves, and is beyond the point of producing muscular contraction, being therefore eminently suitable for our patients. This high frequency current is applied to the body by means of various electrodes. These are made in all forms to meet various requirements.

B. IONIC MEDICATION.—This treatment consists of the introduction of various drugs, or more particularly speaking, their ions, into the tissues by means of a direct or galvanic current. The most common drugs used for this purpose are, Sodium chloride, Iodine, Sodium salicylate, Zinc sulphate, Magnesium sulphate, Lithium chloride, Silver nitrate, Copper sulphate, Mercuric chloride, Quinine, Cocaine, and Adrenaline.

This method of treatment has special advantages which are possessed by no other method. The current passes into every part of the tissue under treatment, and the ions travel the same path; therefore every part in which the solution of the drug selected makes contact will be penetrated by an electrical current, and the cells and the inter-cellular spaces will receive the ions. There is a further advantage by using this electrical current, as only the therapeutically active ions are taken in. Another advantage is, that the ions are introduced only into the region where they are wanted.

The apparatus required is the most simple of all electrical equipment and the current is supplied to the body through pads soaked in the required solution.

ULTRA VIOLET RADIATION.—Very little need be said about the therapeutic effects of artificial sunshine, but the following remarks may be of interest. Metabolism is increased by exposure to ultra violet light. Increased expiratory, excretory and protective power is now an accepted fact.

Diseased tissue is destroyed and healthy granulations are stimulated. Bacteria in the tissues are all killed within five minutes to a depth of one millimetre, and no known form of bacteria can live in this ultra violet light for more than five minutes. Spores are killed within seven minutes.

To appreciate how powerful this action is, radium requires five hours to kill bacteria. Ultra violet rays not only kill the bacteria, but also break down the toxic poisons resulting from the presence of the bacteria; and in addition to this powerful bactericidal effect, they affect the human body by changes in the body cells, blood, glandular activity, nervous system, and eliminative processes.

The particular form of apparatus I use is the mercury vapour lamp; although other forms (such as the Tungsten quartz or carbon arc) can be obtained, each of which have their own peculiar property.

HIGH FREQUENCY.

I append a few notes of the last twelve consecutive cases which I have treated by the High Frequency Method, from which I feel sure it will be appreciated that there is big scope for further work. The treatment in each case consisted of the application of H.F. current for from five to seven minutes, three times per week, and no further treatment whatever was given. The patients do not object; and no restraint, beyond steadying them on the table, is necessary. In practically every case which I have treated, beneficial results have been seen after the first treatment, the patient being much better in himself generally. The owners have often remarked upon this.

CASE 1.—A black mongrel terrier dog, suffering from complete paralysis of the hind quarter associated with chorea, as a sequel to distemper. After the fourth application the dog could stand and had regained control of bowels and bladder, which he had entirely lost hitherto. The progress was gradual, and at the end of the eighth treatment, when he could run quite freely, the treatment was stopped; and at the end of a further ten days he went rabbiting again, the owner said, " as well as ever."

The muscular twitchings from chorea, I am sorry to say, never

XIIM

passed off, and this form of treatment has apparently little beneficial effect for this affection.

CASE 2.—A Setter dog, four years old, suffering from paralysis of the hind quarters, although not so complete as in the previous case, as the animal was able to drag himself along and occasionally partly raise himself. Cause unknown. Seven applications were given, and the dog is apparently as well as ever.

CASE 3.—A wire fox terrier bitch. Complete paralysis of the hind quarters, loss of control of bladder and bowels, probably following distemper. Nineteen applications of the treatment were given and complete recovery resulted; the bitch afterwards being mated and now having a fine litter of puppies.

CASE 4.—A Pekingese puppy, three months old, had been suffering from distemper, and was now one of the worst cases of chorea I had ever seen. The owner was, however, devoted to the puppy and would not consent to have it destroyed. Before treatment the puppy was quite unable to stand, and the muscular spasms were continuous throughout the whole body. It used to bang its chin so much on the ground that a pad had to be made to prevent the extension of the injury which it caused. After the fifteenth application this puppy could walk, but occasionally fell over when it went too quickly. The muscular spasms were much less, but have always remained, although after the twenty-third application he used to follow the owner about, but was unable to get upstairs.

CASE 5.—A small black and tan toy mongrel. Paralysis of the hind quarters, which, a week after the eleventh treatment, came to see me, sat up and begged.

CASE 6.—A Spaniel dog, 18 months old. Complete paralysis of the hind quarters, with loss of control of the bladder and bowels. This patient could race the owner along the road after the tenth treatment.

CASE 7.—A Pekingese dog, four years old, with paralysis of the tongue. This animal was unable to feed itself and the owner used to do so by putting food down its throat. After 10 applications of the treatment he could draw back the tongue and pick up food off the plate, but unfortunately the owner left the district and I was unable to carry out further treatment.

CASE 8.—A Fox terrier dog, 12 years old. Complete paralysis of the hind quarters, thought to be due to an injury received when dropping over a fence. This dog could stand after the sixth application, but the owners made up their mind to have it destroyed.

CASE 9.—A Sealyham terrier bitch. Partial paralysis of the hind quarters, the hind feet being dragged so that the nails were worn

down to the flesh. Four applications were given with complete recovery as the result.

CASE 10.—A wire-haired terrier dog. Having heard the results obtained in the treatment of cataract in the human subject I decided to apply the high frequency to a case of old standing opacity of the cornea. This dog had, some two years ago, received an injury to the eye which left a very dense opacity covering more than half the cornea. Various forms of treatment had been tried to disperse this without success and the case was given up. I obtained permission from the owners to try electrical treatment, and after the third application there was marked improvement, after the sixth application more than half the opacity had disappeared. The owners of this animal have gone away for the time being, but have promised to bring the dog back to me on their return.

CASE 11.—A Pekingese dog, three years old, with partial paralysis of the hind quarters, much as in the case of Case 9. This required 10 applications of the treatment before recovery.

CASE 12.—A valuable wire-haired fox terrier, with complete paralysis and loss of control of bladder and bowels. This animal was brought to me on Christmas Eve last and was unable to move a muscle, except those of the eyelids. It laid perfectly limp in whatever position he was put. After the third application the animal could raise its head and would remain sitting up if put in that position. At the end of the sixth application it could walk, and after the tenth application he ran across the road after another dog.

These few cases will, I think, show the value with which high frequency treatment can be applied to our animals.

IONIC MEDICATION AND THE VIOLET RAYS.

I am not prepared at the moment to detail a list of cases which have been treated by ionic medication and the ultra violet rays. Suffice to say that my experience at present points to the fact that indolent ulcers and wounds rapidly assume a healthy character, moist eczema quickly dries up, that there is marked general improvement in the latter stages of debilitating diseases such as distemper, and that there is a most marked improvement in cases of pneumonia, when one or other of these forms of treatment is employed. Up to the present the results point very favourably for the use of ultra violet radiation in cases of follicular mange, rickets, and chorea. As there has certainly been marked improvement in these cases which I have so far treated, I hope later on to be able to furnish some interesting results.

XUM

RADIOGRAPHY AND FLUOROSCOPY.

I cannot leave the subject of electricity in canine practice without a word on the use of X-rays for diagnosis purposes. I have now for some considerable time had an apparatus for this work and must say I have found it of invaluable service. In many cases a screen examination is all that is necessary and this can be done in a few minutes at a very little cost. The exact nature of the injury can be definitely determined, as for instance, in the case of an obscure fracture, the position of some foreign body (such as a needle or small object which cannot easily be felt) or the position of a calculus in the urethra or bladder.

All such cases are readily determined and a definite opinion can be given at once.

STERILITY IN A DOG x DINGO CROSS.

BY Y. TAMURA,

Animal Breeding Research Department, the University, Edinburgh.

IT is established that the practice of inbreeding—that system of breeding in which the closest possible types of mating are made—is, in many instances, attended by an ever-increasing infertility in the stock. The opportunity of making a thorough examination of the endocrine organs of a highly inbred and ultimately sterile stock was presented by Mr. T. H. Gillespie, Director of the Scottish Zoological Park, who placed at the disposal of the present writer certain dingos and dingo crossbreds which were the end-result of an interesting experiment in inbreeding.

The original stock consisted of a brother and sister which, during the period 1913-1920, produced some eighty cubs. When the original male died the bitch was mated with one of her sons and produced a further litter. Two bitches out of this litter produced offspring to the service either of their father or their brother, and all these individuals proved to be absolutely infertile not only *inter se*, but also when crossed with ordinary dogs. Not only were these individuals, males and females, sterile, but they were exceedingly delicate, extremely nervous, and simply would not thrive.

In this paper it is proposed to make a report on the examination of the two females of this group.

Dingo Bitch " A," weight 21·5 lbs., extreme body length 23 inches. External genitals as those of a normal female ; four pairs of teats. Ovaries were small (left 0·38 gms., right 0·36 gms.) and shrunken in appearance. Uterus of rudimentary proportions, the diameter being

about a quarter of the normal size. Thyroid very large and vascular with the two lobes unconnected by any isthmus (left weighed 21·40 gms. and right 20·22 gms.). Adrenals weighed about 1·05 gms. each and were normal in appearance. Pituitary was of normal appearance and weighed 0·06 gms. Thymus could not be identified.

Dingo Bitch " B," weight 20·5 lbs., extreme body length 22 inches. External genitalia as those of a normal female ; four pairs of teats. Ovaries small (left 0·37 gms., right 0·37 gms.), shrunken and irregular surface. Uterus of infantile proportions, 14 cms. x 4 mm. Fallopian tubes adherent and no connection existed between ovaries and uterus. Thyroid large and vascular (left weighed 8·89 gms., right 15·79 gms.) ; no isthmus. Adrenals of normal appearance (left 1·07 gms., right 0·94 gms.). Pituitary of normal appearance, weight 9·12 gms. Thymus could not be identified.

The uterus, ovaries, thyroid, adrenal, and pituitary from each case were fixed in Allen's Bouin and Regaud immediately after death. Sections 4–6μ in thickness were stained with Delafield's haematoxylin and eosin and Altmann. Histological examination of sections disclosed the following facts : The uterine mucosa consisted of a single layer of epithelial cells lying with the long axis parallel to the uterine lumen (Fig. 1). The gonads had a structure typically ovarian. Each ovary (Fig. 2) was encapsuled by fibrous connective tissue migrating strands of which permeated the stroma between the smaller oocytes clustered at the periphery of the gland. A few large follicles, apparently normal, were present, but follicular degeneration affecting both large and small follicles was common. No mitotic figures were encountered, and no corpus luteum was found.

No normal vesicle was found in any section of the thyroid (Fig. 3). The vascular epithelium was high columnar and the protoplasm of these hypertrophied cells was reticulated. Desquamation of this epithelium was common. The nuclei of the parenchyma varied greatly in size and were oval or spherical or pyriform in shape. The large size of the vesicular epithelium reduced that of the acini cavities. The staining properties of the colloid were extremely variable. Amidst the intervesicular tissue were many small acini, regarded as evidence of the formation of new vesicles. The blood vessels were greatly engorged and tortuous, the perivesiular capillaries distended, and the blood in the large veins contained disintegrated cells or degenerated nuclei. The connective tissue framework of the gland was far more prominent than in the normal thyroid.

The suprarenals were distinctly abnormal. Processes from the fibrous capsule passed inwards towards the centre of the gland carrying with them the zona glomerulosa almost to the border of the medulla

(Fig. 4), so that this tissue was to be found amid the zona faciculata. The zona glomerulosa and faciculata were normal in structure save that many of their cells were hyperchromatic, an indication of early degeneration. The normal reticular arrangement of the zona reticularis was absent; in many parts the cells had completely disappeared, leaving the connective tissue framework bare; in other parts a thin

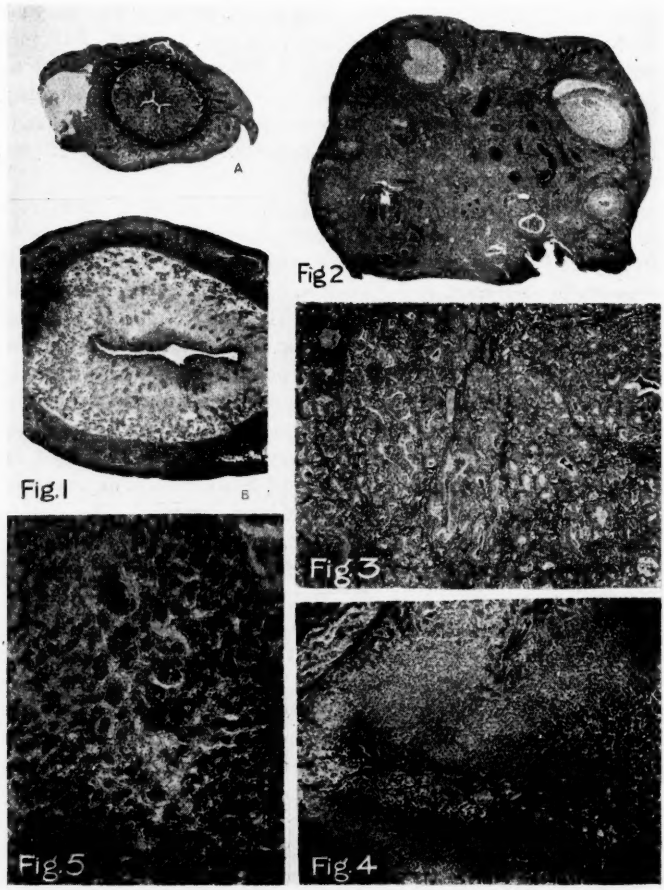


FIG. 1.—(A) Uterus of Sterile Dingo Bitch; (B) Uterus of Fertile Dingo Bitch of the same age. ×10. FIG. 2.—Ovary of Sterile Dingo Bitch. ×15. FIG. 3.—Thyroid of Sterile Dingo Bitch. ×65. FIG. 4.—Suprarenal of Sterile Dingo Bitch. ×375. FIG. 5.—Pituitary of Sterile Dingo Bitch. ×90.

layer of normal cells was present along the border of the medulla. Granular cells could not be identified, although the area stained normally with eosin. Many of the cells were vacuolated. In certain areas near the medullary border cells with nuclei of irregular shape were tightly packed, whilst towards the zona faciculata the distribution of cells was as that in the normal gland. Engorged capillaries were numerous amid the zona reticularis. The outstanding feature of the pituitary was the abundant supply of engorged capillaries to the anterior. Eosinophil cells in which the cytoplasm stained evenly with acid fuchsin or else was vacuolated were scattered throughout the gland, in some areas being tightly packed. Among these could be seen other cells with clear protoplasm and minute granules. Areas, showing white with black specks, were everywhere present, consisting of thin threads of the connective tissue framework and degenerated nuclei. Colloid was present in the pars anterior of bitch "A"; in the second case it was not found.

Discussion.

These cases are of interest for the reasons that the individuals were the products of inbreeding and on examination conditions were found that could readily account for the fact that they had failed to breed. It is the experience of breeders that in an inbred stock it is not uncommon to witness a progressive increase of infertility; the individuals exhibit relatively weak sexual desire, the signs of heat are relatively slight, mothers desert their young, and these signs increase until the stock is absolutely sterile. Towards the end of this process it is found that the individuals of the stock become mutually infertile though remaining fertile when mated with unrelated individuals.

The genetical interpretation of such a result of inbreeding is that this system of mating quickly leads to homozygosity in respect of any character, and it has been shown that grades of fecundity and of fertility are characters in this sense. This interpretation argues that if in the stock are present the factors for low grades of fecundity it is possible to concentrate these factors by inbreeding, so that the stock will quickly become sterile. Outcrossing, as it were, dilutes this concentration.

The question of supreme interest in this matter is that which concerns the mode of action of the factors that lead to low fecundity. How do the genetic factors that determine infecundity produce this result? This question cannot find a complete answer in the cases described in this paper. However, the cases present certain significant features which indicates the probable manner in which these factors act. If, as a result of genetic action, one or more of the glands of

XUM

internal secretion were abnormal, then the end-result might certainly be sterility. It is established that degeneration of the adrenal cortex is followed by an enlargement of the thyroid; that degeneration of the thyroid is followed by corresponding degenerative changes in the pituitary and by the presence of colloid in the pars anterior; it is also established that after extirpation of the adrenal the ovarian functioning becomes profoundly depressed, no further corpus luteum formation occurring, and that in the presence of such ovarian tissue the uterus remains rudimentary in its proportions. It would seem to be sufficient, then, to postulate that in this stock there were genetic factors that in their action lead to abnormality in the organisation of the adrenal. Lethal factors of this kind have been demonstrated.

Careful enquiry failed to disclose any environmental cause for the sterility in these cases. Housing and food could not be blamed, and it is reasonable to hold that the infecundity was genetic in nature. It was not possible to make any real critical tests of this hypothesis, it so seldom is in the case of large animals, but from what is known concerning other forms, it is entirely justifiable to ascribe the sterility in these cases to the inbreeding that had been practised, and to hold that this sterility was a secondary effect of a hereditary abnormality in the organisation of one or more of the endocrine glands, and that the genetic factors for this abnormality present in the original stock had been concentrated in the later generations by the ordinary hereditary mechanism during close breeding.

The author wishes to record his thanks to Dr. F. A. E. Crew for very kindly providing the material and for much helpful advice during the course of the present investigation.

COMMUNICABLE FELINE DISEASES.

By HAMILTON KIRK, M.R.C.V.S.,
London.

THE possibility of disease dissemination from animals to man is a question which not only merits, but receives, the closest attention. Only a week or so ago a leading daily newspaper published a deal of correspondence in which the domestic cat was roundly condemned by some, and as stoutly defended by others.

Many charges are laid against it from time to time by people who are more or less ignorant of animal pathology, and usually they succeed only in scaring the nervous folk or the mothers and guardians of children. The domestic cat is singularly fortunate in being the subject of comparatively few diseases, and especially few *infectious* diseases.

If we exclude skin ailments, the specific diseases may, indeed, be counted upon the digits of one hand, and of these only two have any significance for the human race, namely tuberculosis and diphtheria.

As regards the latter, the poor cat has for long been blamed as a disseminator of its infection, but, as I hope to show, this allegation has very little foundation. It has for many years been a most controversial question whether cats are or are not susceptible to *true* diphtheria, and many bacteriologists who have attempted to settle the matter by experiment and laboratory observation, have deduced evidence which can hardly leave any doubt in the mind. The bulk of the findings are undoubtedly to the effect that the true Klebs-Loeffler bacillus of diphtheria finds no *habitat* in the cat. It is true that the clinician will occasionally meet with a cat showing diphtheritic lesions in its throat resembling those seen in true diphtheritic throats of human beings, but these are due to a bacillus which differs culturally from the true bacillus of diphtheria. Moreover, they are frequently secondary to some other disease, such as distemper, and are rarely of primary importance.

Dr. Savage, the well-known Medical Officer of Health for Somerset, stated in the course of his investigations that "a few diphtheroid organisms were isolated from the throats of healthy and catarrhal cats, but in no case was the true Klebs-Loeffler bacillus found." Even when the cats were closely associated with known cases of human diphtheria, the same negative results were obtained, and nothing suggesting any common occurrence of feline "diphtheria-carriers" was noticed, even after the most careful bacteriological investigation. More conclusive still is the fact that Dr. Savage, after many attempts, failed completely to cultivate virulent human diphtheria bacilli on the throats of either kittens or grown cats. The bacilli could never afterwards be recovered from the animals, and nothing approaching a carrier condition was ever produced.

In the issue of *Nature*, for April 28th, 1924, comment was made upon a case in which diphtheria caused the death of a little girl. Her mother felt positive that the disease had been contracted from some fowls which lived in the house, and the doctor in attendance seemed inclined to the same view ; but from an exhaustive and critical analysis of the literature on the subject, the writer of the article declared most emphatically that the current and popular belief in the transference of diphtheria from animals to human beings rests upon valueless evidence. No proved diphtheria bacillus has ever been found occurring *spontaneously* in cats, dogs, or fowls. So-called croup and diphtheria in birds have nothing to do etiologically with human diphtheria. Even in cases of so-called milk borne

epidemics of diphtheria, supposed to be due to cows suffering from the disease, in more than one instance the evidence showed the probability or the certainty of the outbreak being assignable to diphtheritic infection of the people concerned with the milking of the cattle.

In 1908 Graham Smith made the following statement : " A general impression prevails that cats contract diphtheria from human subjects and very numerous instances have been quoted of cats apparently suffering from diphtheria communicating it to children. Other examples are quoted of cats, although remaining quite well, being the only probable carriers of infection. Very few of these cases seem to have been bacteriologically examined, and in no instance has the presence of diphtheria bacilli been satisfactorily proved."

That eminent veterinary bacteriologist, Sir John McFadyean, entirely failed, during some cultivation experiments, to reveal the presence of any diphtheria bacilli in the false membranes removed from affected cats' throats. There is no doubt but that times out of number people have been seen fondling and kissing creatures so affected, without themselves becoming affected.

The matter is of great importance from a Public Health point of view, and, whilst the cat may certainly suffer from malignant sore throat which is infective only to its own species, an assurance can be given to those cat-owners who are apprehensive, that no harm is likely to befall them from the maintenance of a cat in the home.

Now a few words about tuberculosis ! Unfortunately, the feline species is not immune to tuberculosis, the domestic cat being affected to the extent of about three to four per cent. The disease gathers importance from its communicability to the human race, little children being especially endangered from their habit of cuddling and kissing their pet animals. There seems a tendency to overlook the possibility of this disease occurring in dogs and cats, that is to say, it is frequently forgotten and unsuspected. Tubercle principally attacks the adult cat, but, contrary to what one might suppose, it is not unknown among young kittens.

In view of the high degree of resistance manifested by cats to the human tubercle bacillus, experimentally introduced, it is not to be anticipated that this type of bacillus plays an important part in the causation of naturally acquired tuberculosis in cats ; yet specific instances have been known in which cats have contracted the disease from their consumptive owners. The main source of infection to cats is tuberculous milk of the cow.

Consumption may exist in an animal without being suspected (at least, in its early stages), even as it may so exist in a human being ;

and it is an extraordinary fact that many post-mortem examinations upon dogs and cats have revealed extensive phthisis without these animals ever having been known to cough during life, and it has been a source of wonder how any living being could have sustained such a pronounced lung affection without manifesting it in the usual way. Cats affected with the pulmonary form of tuberculosis sometimes sneeze, the material so ejected being charged with tubercle bacilli. Thus it is not wise to allow children to kiss their animals' heads, or pet them too closely.

It is not uncommon for cats and dogs to sleep with their owners, and where this is permitted, the latter run a certain amount of risk of contracting several complaints.

There is a danger of infection to both man and animals from the bite of a cat afflicted with intestinal tuberculosis, more than one case having been reported in support of this statement. Cases of tuberculosis occurring in a household might easily and erroneously be thought to emanate from the family cat; but it should be borne in mind that the chief source of TB in domestic cats is (as previously stated) the drinking of tuberculous cows' milk. Human beings are just as likely to contract the disease from the same source. So it would appear at first glance that the cat is a somewhat dangerous animal in so far as tuberculosis is concerned, yet we should bear in mind that only three to four per cent., at the outside, of cats are affected, and that none of them emulate the dangerous human habit of expectorating, and therefore usually have very little opportunity for spreading the disease.

Of the contagious skin diseases only two are communicable to man, namely, mange and ringworm. Dealing first with mange, it can be safely said that only upon comparatively rare occasions does a human being contract this disease from an animal. When one thinks of the millions of dogs and cats which reside in these islands, and of the hundreds of cases of sarcoptic mange occurring among them annually, one has only to realise how exceedingly rarely one encounters or even hears of a person who is able to state definitely that his or her skin complaint can be directly traceable to an animal. Veterinary surgeons are handling such cases daily, and yet they rarely contract from such affections. Nevertheless, concrete cases are known to have arisen from time to time, in which mange in the dog or cat has been followed by an itchiness in its owner, microscopical investigation having proved that the parasites taken from the lesions in each case, were identical. Each animal has its individual parasite possessing

XUM

a characteristic size and shape; so that once the creature is found there is no mistaking its source of origin, provided that the investigator knows what he is looking for. Scabies which is contracted from a dog or cat is, however, a much more benign malady than the true *human* scabies, and there is no great difficulty in getting rid of it if the proper measures are adopted.

Reference might well be made to that other type of skin disease—follicular mange. Curiously enough, when this occurs in a dog, it is often regarded as incurable and eventually fatal. Cats, on the other hand, rarely if ever suffer from it, and man is known frequently to harbour the Dermodex in his skin without it ever occasioning the slightest inconvenience. These points are eloquent testimony to the fact that parasites have predilections for certain hosts as well as for certain portions of the host.

Lastly, I will touch upon ringworm. This fungoid affection of the skin is occasionally encountered in domestic cats, on account, no doubt, of its prevalence among rodents. Rats and mice are affected principally with a type of ringworm known as Favus, and it follows that this type is infective to the cat. Cats may also contract a favus from man, and in turn may affect *him*. Cases have been reported in which human beings have become infected by their cats, dogs, or tame mice, with ringworm, and whilst it is not by any means a serious disease, it sometimes proves very troublesome to eradicate. Whilst ringworm sometimes appears to set up some slight irritation in dogs, nothing can be felt by the human being, and practically nothing at all by cats. The ringworm which is conveyed from cats to man usually attacks the body only, whilst that conveyed from man to man most often affects the head. The former type may generally be cured in about three days, thus differing from the scalp type, which frequently is amenable only to X-Ray treatment.

Here, again, we should bear in mind that practically every mansion, cottage and workshop, throughout the country, harbours its pet cat, and their numbers aggregate to a colossal total. Yet how often do we find a case of ringworm among them? Comparatively seldom! And if one *is* found, it is suitably dealt with and kept under control.

So that in conclusion, I might again lay stress upon the view that we have little indeed for which to blame our cats, but that we obtain much valuable service for which we might be more grateful than we are.

XUM

Clinical Articles

A NOTE ON TREATMENT OF EQUINE TRYPANOSOMIASIS (SURRA) "IN THE FIELD" IN INDIA.

By CAPT. G. G. HOWARD, M.R.C.V.S., D.V.H.,
Indian Veterinary Service, Bihar, India.

TEN horses were collected in an isolation camp, all showing trypanosomes in their blood and showing the typical symptoms of "Surra," i.e., swelling in dependent parts, lassitude, icteric membranes with small petechae, progressive wasting and varying temperatures up to 104°. Appetite good, but varying with rises in temperature.

No definite period was observed between the rises in temperature. They seemed to occur at intervals ranging between three and ten days. Some of the animals were more heavily infected with parasites than others, but the general condition and appearance of all animals was similar.

Treatment was commenced on October 14th, 1924, with intervals up to November 16th, 1924, interval to December 18th, 1924, interval to February 6th, 1925, and final injection February 13th, 1925.

The line of treatment adopted was a combination of Antimony Potassium Tartrate, Arsenic, and Atoxyl, followed by intravenous injections of "Bayer 205" or "Naganol."

The strength of solutions used were: (a) Antimony Potassium Tartrate, normal solution (practically 3 per cent.); (b) Arsenious Acid Solution, 1 per cent.; (c) Atoxyl, 4 per cent. solution; (d) Arsenic, crude Arsenic Powder; (e) Bayer 205 (Naganol), 20 per cent. solution.

Each horse was weighed, and blood smears were taken and examined daily from each animal from October 13th to November 16th, after which blood smears were examined weekly.

Two methods of administration of the drugs were tried, both methods beginning on October 14th, 1924, with an intravenous injection of 7cc. of a normal solution of Tartar Emetic. This injection caused slight toxic symptoms of muscular tremors, staggering, salivation and sweating which disappeared after 20 minutes. The blood of the animals on microscopic examination next day and the following day showed no Trypanosomes, but in most cases Trypanosomes reappeared on the third day after the injection. During these few

days the animals showing swellings in dependent parts improved, the swellings decreasing considerably.

On October 20th, 1924, the administration of Arsenic commenced. The ten animals were equally divided for the purpose of testing two methods of administering a combination of the three arsenical compounds available. The first method ("A") consisted in giving, on consecutive days, first 1,000 cc. of 1 per cent. Arsenious acid solution, then 100 cc. of 4 per cent. solution of Atoxyl subcutaneously, then 1.5 grammes of crude Arsenic in bolus. This was followed by an interval of three days, when the same dosage was repeated on three consecutive days followed by three days interval. This treatment was continued until November 20th, 1924, the dosage of Atoxyl being increased to 125 cc. on the last two injections.

The second method ("B") differed in the intervals of treatment only, the dosage being the same ; Atoxyl and crude Arsenic alternated, with a day interval between each administration ; the 1 per cent. Arsenious Acid Solution not being used in this method. This method was also continued until November 20th, 1924.

RESULT OF TREATMENT OF THE FIVE ANIMALS TREATED BY "A" METHOD.

Case.	Date.	Slides.	Treatment.	Remarks.
1	2	3	4	5
Case No. I	27–11–24	+	—	Temperature 104·4. Relapsed, parasites present in blood ; destroyed.
Case No. III	19–1–25	+	—	Relapsed, parasites present in blood ; destroyed. Temperature 104·4.
Case No. V	13–2–25	—	(See "Naganol" Table).	Still alive ; apparently healthy and in good condition, doing ordinary work from 15–2–25.
Case No. VIII	6–11–24	—	Treatment not completed.	Broke loose and fell in a ditch and was destroyed.
Case No. X	13–2–25	—	(See "Naganol" Table).	Still alive, apparently healthy. Blood free from parasites ; doing ordinary work from 15–2–25.

The symptoms noticed during the month of treatment by these methods were similar in character. After administration of a dose, the animal showed a slight temperature which disappeared quickly, the leg swellings and other swellings disappeared during the first week of treatment ; the animals fed well. The urine became thick and dark-coloured, and usually colicky pains were evinced for an hour or two after a dose or injection. After a fortnight haematuria was observed accompanied by stiffness in the hindquarters and slight inco-ordination of movement at exercise, general condition much improved. The first method of treatment was intensive with long intervals ; the second method was gradual, one day's interval being allowed between each administration of Arsenical compounds.

The supply of " Naganol " or " Bayer 205 " arrived from Germany later than I expected, and I was only able to make use of it about one month after treatment with the other drugs had been completed. The treatment with this preparation will be dealt with separately later.

Out of the ten cases treated, five were treated by " A " method, and five by " B " method.

At the time when I received the " Bayer 205 " (Naganol) (on December 18th, 1924), there were only six animals left out of the ten, i.e., Cases No. II, III, V, VII, IX, X.

Case No. II had by that time shown a reappearance of parasites in the blood on December 3rd, 1924, but I kept the animal to test the effect of " Naganol." This animal received two grammes of "Naganol" intravenously on December 18th, 1924. On December 19th, 1924, the blood still showed parasites. On December 27th, 1924, the blood was clear of parasites. The blood remained negative, but the animal became gradually weaker in the hindquarters. Eventually on January 16th, 1925, the animal got down in his stall and was unable to rise at the time of destruction.

Case No. III I did not treat with " Naganol " as I wished to leave her as a control to prove whether the previous treatment alone would cure her, as she had not shown any relapse up to December 18th, 1924. She relapsed on January 19th, 1925, and was destroyed.

Case No. VII is improving, but Paraplegia is still noticeable. The other cases are being ridden daily ; doing their ordinary work. Blood smears are being examined weekly from these animals in case of a relapse. They have now remained eight months without showing any Parasites in the blood, but four months of that time has been spent under treatment.

Cases No. V and X have never shown any parasites in the peripheral blood since the injection of Tartar Emetic solution on October

XUM

RESULT OF TREATMENT OF THE FIVE ANIMALS TREATED BY "B" METHOD.

Case.	Date.	Smears.	Treatment.	Remarks.
1	2	3	4	5
Case No. II	3–12–24	+	Nil.	Relapsed. Parasites numerous. Temperature 104. Kept to test efficacy of "Bayer 205." Inco-ordination and paraplegia noticeable, feeding fairly well.
	18–12–24	—	2 grammes "Naganol" intravenously.	Temperature 102·2.
	19–12–24	—	Nil.	Temperature normal.
	27–12–24	—	Nil.	Feeding well. Paraplegia marked. Losing condition.
	16–1–25	—	Nil.	Paraplegia very marked; unable to rise in the stable; condition poor; destroyed. Smears showed no Trypanosomes.
Case No. IV	16–11–24	—	Nil.	Paraplegia and inco ordination well-marked. Urine slightly blood tinged.
	16–11–24 to 27–11–24	—	Hot blankets applied to loins.	
	28–11–24	—	Nil.	Fell down, unable to rise and died. Smears negative.
Case No. VI	22–11–24	+	Nil.	Relapsed. Destroyed. Temperature 104. Parasites fairly numerous.
Case No. VII	13–2–25	—	(See "Naganol" Table.)	Still alive, but shows inco-ordination and slight paraplegia which is gradually improving.
Case No. IX	13–2–25	—	(See "Naganol" Table.)	Still alive; apparently healthy and in good condition, and being ridden daily.

TREATMENT OF CASES V, VII, IX AND X WITH "NAGANOL" (BAYER 205).

Date.	Blood examination.	Treatment.	Remarks.
1	2	3	4
18–12–24	—	One gramme Bayer 205 intravenously.	No visible effect.
22–12–24 29–12–24 5–1–25 13–1–25 21–1–25 28–1–25 5–2–25	—	Nil.	Weekly blood examination. Nothing to note clinically.
6–2–25	—	2·5 or 3 grammes "Naganol" intravenously according to body weight.	No visible effect.
13–2–25	—	2·5 or 3 grammes "Naganol" intravenously according to body weight.	No visible effect.

14th, 1924. Case No. VII and IX showed parasites in the blood a few days after the intravenous injection of Tartar Emetic, but have shown none since October 22nd, 1924.

CONCLUSIONS.

The treatment by method "A" or "B" alone is apparently not efficacious.

Treatment by "Bayer 205" (Naganol) alone was not successful in the only case showing parasites in the peripheral blood (Case II) on which it was tried. Although parasites disappeared from this animal's peripheral blood a week after the injection of "Naganol," yet the progressive paralysis, which is one of the main symptoms in Surra, persisted to the end and was eventually the reason for destruction. Unfortunately post-mortems were not made on the animals destroyed owing to risk of spreading the disease, otherwise an examination of the tissues of the liver, spleen, kidneys, etc., might have shown the existence or non-existence of Trypanosomes in their resistent forms, thus deciding the question of whether paralysis was due to Surra or the result of treatment.

Treatment by a combination of method "A" or "B" with "Bayer 205" appears to be successful.

I am of opinion that the course of Arsenic treatment given was too

severe, and I think might be considerably reduced with equally good effect if followed closely by the " Bayer 205."

The symptoms of Nephritis, shown by practically all the cases during the Arsenic treatment, were to be expected ; Atoxyl proved to be the main cause of this symptom.

Paraplegia was present in all cases to a greater or less extent after one month of treatment ; but as this symptom was present in extreme cases of the disease which were destroyed before the treatment of these cases was taken up, I am of opinion that the paralysis was not entirely due to the Arsenic treatment. Three of the four apparently cured animals show no sign of paraplegia now ; the fourth animal is still affected, but is improving.

A CURIOUS COW CASE.

By HUGH JAGGER, O.B.E., M.R.C.V.S.,
Buckingham

Requested one evening to go and see a cow which was unable to rise, the owner stating that it could not be Milk Fever as the cow had calved 4 months before and was not again in calf.

On my arrival in the loose box the animal immediately attempted to get up, but fell back and lay stretched out on her left side quite flat, with the two top legs stiffened out and showing violent convulsive movements for about one minute and then all movement suddenly ceased and breathing continued very rapidly for a few respirations and then ceased completely. My remark to the owner was, " I have just arrived in time to see her die," and we might easily have closed the box door and sent for the knacker, but we stood watching her for what seemed to be some minutes and conversing on the bad luck farmers invariably were liable to, when suddenly the carcase (?) took a deep breath, followed by other sighs and started breathing regularly and shortly raised her head. We propped her up and I inflated her udder and left a man with her for the night.

The next morning she was apparently quite comfortable and eating a mash. She lay for three days and rose on the fourth unaided, and has made a good recovery. The only medicine given was Nux Vomica and Carbonate of Ammonia in gruel, and a little green blister was rubbed into the loins on the second day.

Was it merely a fainting fit due to digestive derangement, or had it any connection with the phenomenon of Milk Fever ? Several recoveries in cases of " Cow Down " nowhere near the time of parturition, have occurred in my practice recently after inflation of the udder.

CHONDROMA OF THE SUPERIOR MAXILLARY SINUS IN A DOG*

By TOM HARE, M.B., Ch.B., B.V.Sc., M.R.C.V.S.,
The University of Liverpool.

Subject.—A Dandie Dinmont dog, aged $11\frac{3}{4}$ years.

Clinical History.—The owner, a doctor, and a client of Major F. T. G. Hobday, F.R.C.V.S., to whom the author is indebted for the case, gives the following history :—

For eight years the dog was perfectly strong and healthy, with the exception of occasional " boils " between the fore-toes (presumably " Inter-digital Cysts ").

Three years ago, after swallowing some pieces of insufficiently masticated bone, the patient had an attack of subacute intestinal obstruction ; a similar attack occurring approximately twelve months later from an identical cause. On both occasions the symptoms were relieved following repeated enemata.

For the past year or so the patient had attacks of sneezing, with epistaxis, leaving him with a continuous " snuffly " condition of the nose, and partial impairment of his sense of smell. No offensive nasal discharge was observed.

About five weeks ago the nasal catarrh became more marked than usual, but there were no constitutional symptoms. About a fortnight later an oedematous and emphysematous swelling appeared on the left side of the face, involving the cheek and left eyelids, but no localised area of fluctuation could be determined. The swelling, after poulticing for a few days, discharged to the exterior through a small orifice, a thin sero-pus. The swelling partially subsided with the external drainage. External strabismus of the left eyeball, and very marked nasal obstruction were evident, although the patient remained extraordinarily lively to the day of his destruction, under chloroform.

The head and neck were despatched to the laboratory for examination.

Post-Mortem Macroscopic Findings.

External examination of the head revealed a rather firm fleshy swelling attached to the skin over the left superior maxilla, passing backwards on to the left nasal suture above and to the left malar bone below, with consequent partial closure of the palpebral fissure. About the centre of this swollen area, and 1.0 cms. anterior to the inner canthus in the orbital axis, there was an even-edged, clean-cut circular opening in the skin, 0.3 cms. in diameter, through which a yellowish sero-purulent fluid exuded on pressure of the affected region.

* From the Thompson Yates Laboratories, The University of Liverpool.

A probe passed through this orifice encountered the irregular grating suggestive of bone fragmentation, and passed deeply into the cavity of the antrum.

The second upper left, and both lower central, incisors were missing, and all the remaining teeth were thickly coated with tartar. However, none of these teeth showed evidence of abnormality or malposition.

The entire skull was dissected and cut in sagittal section, when the left superior maxillary sinus was found to be almost completely filled by a shining semi-translucent, lobulated, elastic mass, which was intimately attached to the floor of the anterior extremity of the antrum over the region of the canine and first premolar teeth. With this exception the mass had no other attachments, and was bathed with a yellowish-brown sero-purulent fluid, which on culture produced a pure growth of Staphylococcus aureus.

The greater part of the outer bony wall of the antrum, even to the alveolar edge of the canine and first two premolar teeth, which remained unaffected, had been destroyed by an osteomyelitis (*Vide* Plate No. 1). The entire orbital plate of the lachrymal bone had disappeared, permitting the extension of the antral tumour into the left orbital cavity, the orbital periosteum over the lachrymal bone, however, remained intact, though the eyeball was slightly displaced by the bulging mass giving rise to the external strabismus observed clinically. The internal or nasal bony wall of the antrum, together with the left turbinate bones and part of the ethmoid cells had also disappeared, permitting the escape of the tumour into the left nasal chamber. Here the rapid and uninterrupted growth of the mass, which terminated anteriorly in a blunt rounded surface at the level of the alae nasi, had caused a very considerable bulging of the median cartilaginous septum into the right nasal chamber. The left frontal sinus was filled with the sero-purulent material, its external orifice being occluded by the tumour mass, which was commencing its invasion of the cavity. Though the sphenoidal sinus contained sero-pus, it had not been invaded by the tumour.

The subcutaneous connective and muscular tissues over the facial swelling were converted into a mass of thick fibrous granulation tissue containing minute sinuses and foci of pus, the whole intimately interwoven with the skin externally and on its deep aspect with the periosteum of the bones of the face, thus covering and masking the loss of the antral bony wall. Both eyeballs and lachrymal glands, the lymphatic glands of the head and neck, the structures on the right half of the skull, also the brain, its membranous and bony coverings—all revealed no abnormality.

Microscopic Findings.

Sections of the tumour stained with haemotoxylin and eosin disclose its structure as consisting of embryonal cartilage encapsulated in a very narrow connective tissue envelope, the outer surface of which show traces here and there of a columnar epithelial lining. From this capsule delicate connective tissue strands containing many thin-walled blood vessels penetrate the mass of cartilage, the greater part of which consists of rounded and oval cells of varying sizes, surrounded by comparatively little homogeneous matrix taking a pale violet to pink stain. These cartilage cells do not follow the orderly distribution in groups characterising the cells of hyaline cartilage. In parts of the sections near the surface small areas of connective tissue and the adjacent cartilage stain a homogeneous pink, with the loss of structural definition characteristic of hyaline degeneration. No areas of calcification were found in the sections of the tumour.

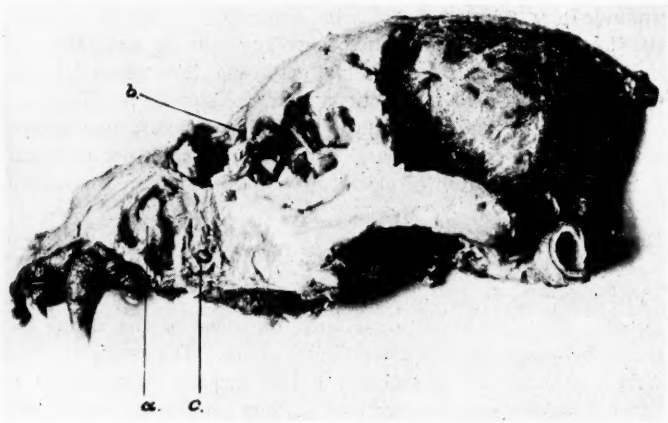
Discussion.

From the above data the pathogenesis of the condition may be inferred. The chondroma arose from the bone of the antral floor pushing before it the antral epithelial lining. The reflex irritation within the cavity led to sneezing and to increased secretion of the epithelial membrane, the stripping of which from the antral walls accounted for the epitaxis. The chondroma, the non-malignant character of which is evidenced by its single attachment, encapsulation and expansive as against infiltrative powers of growth, ever seeking the line of least resistance, passed through the external orifice into the nasal chamber. However, this orifice proved an insufficient outlet for the ever-increasing growth force which exerted itself upon the bony walls of the sinus within which it was confined. It only required the entry into the antrum of pyogenic organisms from the nasal chamber to convert this increasing pressure atrophy of the skull bones into an active osteomyelitis, particularly when those organisms should be Staphylococcus aureus.

The primary origin of the chondroma is premised because such a notion appears to be the most adequate explanation of the evidence. Its origin secondary to a previous sinusitis with its unilateral facial pain, swelling, and oedema, purulent nasal discharge and irregular pyrexia, is not supported clinically or histologically, for in such a case the columnar epithelium would have been destroyed and the tumour would have been a fibrous polyp. Again, certain of these features together with scratching and rubbing of the affected regions

would have been in evidence had the primary stimulus to growth been of a parasitic nature (e.g., Linguatula). Further, there was no reason for incriminating disease or malformation of the canine and premolar teeth or of their alveoli.

Finally, its possible primary origin from an island of misplaced embryonal cartilage has to be considered. The difficulty of accepting this notion is due to the fact that the patient was within the period



Photograph of the patient's skull after removal of all the muscles and the left eyeball—(*a*) The destruction of the superior maxilla, revealing the origin of the lobulated Chondroma in the Antrum. (*b*) The superior portion of the Antrum (after the removal of the Chondroma), showing the destruction of the lachrymal bone. (*c*) T.S. through a focus of pus in the granulation tissue masking the deeper osteomyelitis.

of early old age, whereas chondromata arising from embryonal rests invariably manifest themselves in youth.

The author having encountered these difficulties retires from the discussion with an open mind upon the origin of this singular case of chondroma within the superior maxillary sinus.

Correspondence

THE CURE AND CAUSES OF DISTEMPER.

To the Editor of THE VETERINARY JOURNAL.

SIR,—

In accordance with the promise made to your readers on this day three years ago, we now have the honour to inform you that the Field Distemper Council has resolved to continue the work begun on February 1st, 1923, with all the funds at its disposal until the results then contemplated have as far as possible been achieved.

The chief reasons for our decision are to be found in the enclosed pamphlet, which contains the result of our appeal for subscriptions and the précis of the Report made to us by our Technical Scientific Committee composed of: Professor C. J. Martin, C.M.G., F.R.S. (Director of the Lister Institute); Professor J. B. Buxton, F.R.C.V.S., Professor of Animal Pathology at the University of Cambridge; Capt. S. R. Douglas, M.R.C.S., F.R.S. (late I.M.S.), Director of the Department of Experimental Pathology National Institute for Medical Research; Professor Frederick Hobday, C.M.G., F.R.C.V.S. (Editor of THE VETERINARY JOURNAL); A. J. Sewell, Esq., M.R.C.V.S.; and A. Landsborough Thomson, Esq., O.B.E., D.Sc. (Secretary).

As will be seen from this Report, a very valuable advance has been made in the scientific knowledge of Canine Distemper, one of the most prevalent and most obscure diseases. We desire at once to acknowledge that without the loyal and invaluable co-operation of the Medical Research Council (under the direction of the Privy Council) no such advance would have been possible. The processes of Nature cannot be hurried; her secrets can only be won by continuous and prolonged industry; and, in days when those who may know little of science are only too ready to become impatient of its painstaking and laborious accuracy, we think it right to emphasise the fact that, for the first time in the history of Research, the Field Distemper Council has been fortunate enough to secure the united collaboration of bacteriologists, biologists, chemists, doctors, dog-breeders, editors, masters of hounds, microscopists, veterinary surgeons, and other friends all over the British Empire and the United States, who are working together for one common purpose of general beneficence supported by voluntary contributions from the public. Our programme has involved entirely new methods of research and progress. The source of Distemper has been proved to be an invisible extremely minute organism or virus capable of passing through filters that will hold back all ordinary microbes or bacteria. Though this virus cannot yet be grown or propagated in a test-tube, it has already been stored by appropriate methods for over a fortnight. Though our observers are not yet satisfied in every detail of their proof, they are already well on the way towards bestowing immunity from Distemper upon ferrets, animals which are particularly susceptible to the disease; and this, of course, is the first step towards giving immunity to dogs themselves.

The whole of this advance has been made in the last eighteen months. For a year and a half before that, we were consolidating our plans, assembling our staff, breeding puppies, making the necessary preliminary observations, and building kennels and other essential isolated constructions, better fitted for their purpose than anything of the kind existing elsewhere, at a cost of about £10,000. Nearly all that sum represents a non-recurrent expense involving solid and lasting assets. We must, however, face, in addition, a considerable yearly sum for upkeep, salaries and other necessities, which will only be possible if those who have helped us before continue their assistance, and those who have not yet sent their contributions to our bankers, Messrs. Coutts & Co., at 440, Strand, immediately proceed to do so. The Council's auditors, Messrs. Price Waterhouse & Co., have audited the accounts of our financial Committee composed of: Edward Barclay, Esq., M.F.H., Lord Stalbridge, M.F.H., and Lord Mildmay of Flete. Including the donations of our American

Committee, we have a clear balance in hand of over £5,000; and our printing and clerical services have been undertaken by the *Field* without charge to the Fund, at a cost of nearly £400. If our friends continue to support us only at the average rate at which they have hitherto subscribed, we may feel confident that the £25,000 originally estimated as the final cost of our Research will be forthcoming: and we could be certain of our aim if everyone who takes out a dog-licence this year would send us one shilling. We may add that every half-crown entrusted to us may be said to have immediately and automatically attained the value of at least five shillings, in view of our working with the Medical Research Council, a fruitful co-operation which is producing the ideal results of business partnership, inasmuch as each side benefits equally, and each is satisfied with the dividend. If fully achieved, these results will not only bring relief to millions of dogs who are suffering, or about to suffer, but will, we hope, lead to further discoveries (in diseases of a kindred nature) which will eventually benefit the whole human race.

Owing to the recent successes of Dr. Gye and Mr. Barnard in Cancer research, we are enabled to conclude a letter which we have striven to make as brief as possible with the extremely satisfactory announcement that the new special laboratory for these gentlemen, and other workers upon filter-passing viruses, has been erected in the same area at Mill Hill, which contains the buildings set up by the Field Distemper Council. As soon, therefore, as our studies of Distemper virus have advanced a further step, they can be forthwith submitted under the best conditions to examination by the new methods developed for investigating other members of the same deadly family of invisible agents of disease. Those methods have already compelled the admiration of the world.

PORTLAND (*President*).
BUCCLEUCH (*Vice-President*).
G. R. LANE FOX (*Chairman*).

The Field Distemper Fund,
Windsor House,
Bream's Buildings,
London, E.C.4.
January 30th, 1926.

THE SCIENTIFIC REPORT.*

To some extent the contents of the latest Report of the Technical Scientific Committee to the Field Distemper Council has already been made known, and full scientific accounts of the observations will shortly be published in technical journals, and thus made available in detail to pathologists, veterinary surgeons, and other students.

It is extremely difficult to convey in simple language the important scientific results which have already been obtained, but an attempt must at least be made to summarise for the benefit of our subscribers and the interested public a few points which will indicate the lines of our research; and it should be realised at once that every step taken has been proved by a large number of the most careful experiments.

Animals at Mill Hill.

Details of the buildings and of the arrangements made at the farm laboratories of the Medical Research Council and the kennels of the Field Distemper Fund at Mill Hill have already been published, but are reproduced in later pages. These buildings have continued to give every satisfaction. It speaks well for the interest and zeal of the two Kennel-maids, Miss Smith and Miss Hyslop, that, while they have been in charge of the isolated kennel-compound, there has been no single case of illness or accident among the animals, which are all healthy and well grown, though they are only given food which has been sterilised by heat. What good hygienic conditions can do is clear from the fact that 100 per cent. of puppies born have been reared; and there are now 25 of the second generation born within the compound, which have never been in contact with any man or animal outside. In addition, 151 ferrets have been bred this year; and the pathological observations carried out by Dr. P. P. Laidlaw and Major G. W. Dunkin have invoked the examination of over 200 animals.

It has now been proved that the period of incubation is four days in a dog, nine or ten days in a ferret, and that in dogs there is no relation between distemper and those vesico-pustules which have so often been thought to be certain signs of the disease. The essential cause of distemper is an invisible, filter-passing virus or organism, smaller than any of the ordinary microbes. It has been found necessary to place dogs suffering from distemper in individual kennel-runs situated out of doors at some distance from each other. This is because there is evidence that the infection may be passed from one animal to the other through the air in confined spaces. Ferrets have been found to be very susceptible to the disease; they show it in a characteristic form and readily infect both dogs and other ferrets. Neither cats, guinea-pigs, rats, nor rabbits appear to be susceptible.

Distemper Virus.

The virus multiplies very rapidly in the body of an animal suffering from the disease; and though it has not yet been possible to propagate it in a glass test-tube, it has been successfully stored in a living state for several weeks. This most important achievement at once made two things possible. It has for the first time become possible to study distemper in dogs uncomplicated by any of the numerous secondary infections which nearly always obscure the disease in ordinary life and are so often the cause of mortality; and it has also for the first time become possible to study the methods of producing immunity which should be safe and certain for ferrets, as the first step towards a similar immunity, with or without modifications, for dogs. The

stored virus grows weaker with lapse of time, and there is a critical period in this weakening process at which the virus seems capable of giving immunity to an inoculated animal without giving the disease. The weakening process may involve either a reduction of the minute living organisms to a very small number, or some actual regressive deterioration in the organisms themselves. It is this latter alternative which seems at present the more likely to be true. Immunising tests are also being carried out with virus in which all infecting principle has been killed by heating it for half an hour at a temperature of 60 degrees centigrade. Experiments have also been made with serum collected from animals which had suffered from distemper and were immune from second attacks of the disease, but these have not yet given successful results.

EXPERIMENTS TAKE TIME.

It can easily be realised from what has been said above that a very great deal of patient and laborious work has been necessary to show so much progress in a period of work relatively so short. Particularly in the case of work on the production of immunity ; each experiment has, from its very nature, to be spread over a considerable period of time, and cannot even be begun until a suitably pure stock of animals have been bred, in isolation, by the ordinary processes of nature. The delicate accuracy required throughout all such work implies that it must proceed step by step, and that each step must in its turn be firmly established in order that it may serve as a certain foundation for the next. By this means and by this means alone can such research as this proceed ; and it must be remembered that the results now published from Mill Hill are not only largely new, but have all been proved by processes that are of unquestionable accuracy and have been repeated with sufficient frequency.

* The full and detailed summary of the research work of the Field Distemper Fund which has been done during the past three years has been issued to all subscribers, and can be obtained from the Secretary, Mr. E. W. Moss-Blundell, The Field Newspaper, Bream's Buildings, Chancery Lane, London, W.C.

Errata

Errata in January Number.

Page 22 "Treatment of Operation Wounds."

Line 11 The word "unbroken" should read "broken."

Page 37 "The result of a coarse ligature."
The last paragraph has the words "ligature and inflammatory swelling" transposed, and should read "Undoubtedly the large calibre of the twist was the cause of the inflammatory swelling, although similar ligature has many times been used before without any such sequel."